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The Public Lighting Tables of the American Meter Company will be found in the page advertisement of that Company.

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[NOTICE.]

Wrinkle Department, the American Gas Institute.

To the Membership, American Gas Institute: All members of the American Gas Institute, and others interested, are requested to contribute a description of any novel device or scheme covering any feature of the gas business. Every department of every company uses some novel stunt which would be of value to others. The object of this department is to compile such information. The value of the report depends entirely on the co-operation received. Send in your contribution at once to

MILAN R. BUMP, Editor,
60 Wall street, New York.

[OFFICIAL NOTICE.]

Change of Meeting Place, Michigan Gas Association.

MICHIGAN GAS ASSOCIATION,
OFFICE OF SECRETARY,
DETROIT, MICH., July 1, 1907.

To the Members, Michigan Gas Association: Owing to unavoidable delays in the completion of the new hotel at Kalamazoo, Mich., the Executive Committee has changed the place of meeting from Kalamazoo to Battle Creek, the meeting to be held September 18, 19 and 20, 1907. A notice will be sent in the near future giving full information in regard to hotels and programme, for papers as well as entertainment.

Respectfully,
ALONZO P. EWING, Secretary.

BRIEFLY TOLD.

TIME LIMIT, WRINKLE DEPARTMENT.—In connection with the official notice running in our columns as to the preparing of "Wrinkles" for the next meeting of the American Gas Institute, we call attention to the fact that Editor Bump has announced that all sketches and descriptive matter in the instance of Wrinkles for the Washington meeting of the American Gas Institute must be in hand by August 15. Communications are to be sent to him at his address, No. 60 Wall street, New York.

DEATH OF MR. ARTHUR C. LLOYD.—With regret we have to chronicle the death of Mr. Arthur C. Lloyd, whose earthly career was ended the night of the 12th inst. Deceased was not actively employed in the gas business, although equally interested in all the enterprises in which his brothers (Ernest F. and Alfred G.) were interested. At the time of his death he was Vice-President of the Adrian (Mich.) Gas Company, and also held a like position on the staff of the Lloyd Construction Company. His really active career was concerned with the general contracting and lumbering operations of the Messrs. Lloyd, being President of the Michigan Contracting Company. Deceased was in his 38th year and unmarried.

AN IMPORTANT DECISION.—Mr. F. A. Miller, General Manager of the S. R. Dresser Manufacturing Company, of Bradford, Pa., wishes us to call attention to the fact that the Dresser Patent, No. 625,155, for insulated pipe coupling, granted May 16, 1899, has been passed upon by the United States Circuit Court for the District of Massachusetts and by its decision, dated December 6, 1906, at Boston, the said patent was sustained and declared valid. This decision of the Circuit Court was

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affirmed by the United States Circuit Court of Appeals for the First Judicial Circuit, May 2, 1907. The Company, therefore, cautions all persons to avoid infringing this patent, either by the manufacture of insulated pipe couplings, in infringement of the claims of the Dresser patent, or by the sale or use of insulating couplings manufactured by other parties in infringement of said patent.

CURRENT COMMENT.—

MR. E. W. STEPHENS, who served the Peoples Gas Light and Coke Company, of Chicago, acceptably on its engineering staff for many years, has since last June been serving the Kings County Lighting Company, of Brooklyn, N. Y., as Superintendent of Works, under Chief Engineer Thomas E. Byrne. Mr. Rogers and his friends who "financed" the Brooklyn Union Company originally must, of necessity, feel very sorrowful over their failure to take in the Kings County Gas and Illuminating Company (for such was the original title) when they could have secured the whole outfit for less than $250,000. The Company this winter will surely reach a maximum 24-hour sendout of 3,000,000 cubic feet.

THE Solons who are refusing to grant permits for main extensions to the Joliet (Ills.) Company, which is a branch of Col. Ira C. Copley's Western United American Gas Company, are getting it not only good but plenty. Since last April the Company has received 122 applications for services from residents of houses not on its lines, and the Company would gladly make the extensions, but the ordinance effectively precludes. The Company asks a renewal of its franchise, pledging itself to give $10,000 in a lump sum for public park purposes, and $1,000 per year in cash, provided the life of the franchise is fixed at 50 years. The city contends, too, that as the Joliet Company is no longer a distinct corporation, having become a factor in the autonomy of the Western United Gas Company, the franchise of the former has been forfeited.

THESE condensations of legal decisions affecting the gas industry are of interest:

Validity of Contract for Street Lighting.—In a taxpayer's action against the city of Pittsburgh, Pa., to enjoin the city from carrying out a contract for lighting the streets of the city, which had been awarded to the Welsbach Street Lighting Company of America, it was averred that, when the bids were opened, there was one by the Welsbach Company at $27.50 per light, one by the Cleveland Vapor Light Company and one by the Sunlight Company. The contract was attacked on the ground that the Sunlight Company, the highest bidder, was a subsidiary Company under the control of the Welsbach Company, the successful bidder, but it was held that the transaction was nevertheless regular and that the Welsbach Company was rightfully entitled to the contract.—Sawyer vs. City of Pittsburgh, Supreme Court of Pennsylvania, 66 Atl. Rep., 86.

Liability of Promoters of a Gas Corporation.—Several promoters associated themselves for the purpose of obtaining a franchise to furnish a municipality with gas for light and heat and to that end organized a corporation. One of the promoters, being the cashier of a bank, was delegated to borrow money from the bank for the purpose of purchasing a site for the gas plant. This he did upon notes signed by certain of the associates, but he thereafter wrongfully appropriated the money to his own use. The scheme was finally abandoned after the associates had agreed that all money which had been advanced should be refunded by the first money realized out of the sale of the corporate bonds. In action by the Receiver of the bank it was held that the cashier acted as the agent of the associates in borrowing the money and that they were responsible for the repayment of the amount borrowed to the Receiver.—Ijams vs. Andrews, U. S. Circuit Court of Appeals, 151 Fed. Rep., 725.

No Right to Penalty for Refusal to Supply Gas Unless Provisions of Statute are Complied With.—Where, after a dispute over the amount of a gas bill, which resulted in the removal of the meter and a shutting off of the supply of gas, the consumer, without serving written notice upon the company, waited for 450 days, and then sued to recover the penalty of $10 and $5 for each day beyond 10 days, the company is not liable. The statute which gives the penalty provides for a written application to the company for the resumption of the supply of gas and, being a highly penal statute, its provisions must be strictly complied with. In referring to the plaintiff's long delay before beginning suit, the Court took occasion to remark, "It is suggestive to me of a desire for money, rather than gas, and I do not think the statute was intended to satisfy that desire."—Shelley vs. Westchester Lighting Co., Supreme Court, Appellate Division, 103 N. Y. Supp., 951.

[PROCEEDINGS; FURNISHED BY THE SECRETARY.—CONCLUDED FROM PAGE 101.]

THIRD ANNUAL MEETING, IOWA DISTRICT GAS ASSOCIATION.

HELD AT CEDAR RAPIDS, IA., JUNE 12-13, 1907.

SECOND DAY—MORNING SESSION.

APPOINTING A COMMITTEE.

The President—The Committee on Printing the Constitutton and Proceedings I will name as follows: E. D. Clary, Chairman; Austin Burt and Glenn M. Averill.

The President then introduced Mr. R. H. Lawlor, of Waterloo, Ia., who read a paper on

HIGH PRESSURE TRANSMISSION.

[For the text of the Lawlor paper, see JOURNAL, July 1, p. 8.]

Discussion.

The President—Gentlemen this high pressure transmission subject is of much interest. Mr. Goodnow, we would be much pleased if you will discuss this paper.

Mr. Goodnow—Mr. President, we have been operating a system of this kind in different places for about 6 years, and, as to the success of it, I think everyone agrees who has tried it that it fills a want in gas engineering which no other system of distribution will, especially in thinly populated districts, where the distances for low pressure distribution are prohibitive because of the cost of construction and the position of the plant. We have an example of it in Cedar Rapids—that is, one method of using this system between towns with district regulators. There are other applications, however, by direct transmission to each house meter, which is equally successful where the territory of the consumers is very much scattered. In most cases I think for suburban towns and outlying districts I favor that method of direct distribution without district regulation, provided the district is not already supplied with a low pressure system. Still another application is in boosting old districts. I have an example in mind of two towns lying near each other which have already been piped for low pressure distribution and connected in the ordinary way. By running about 5 or 6 miles of high pressure distribution line, and boosting the weak districts in these two localities, has also been entirely successful and the service so greatly improved as to obviate all of the complaints from those districts which had had very poor service because of small mains. These can be added to the district regulators for boosting low pressure districts, and in nearly every town the expense of giving good service by this method is very much less than can be accomplished by enlarging mains, tearing up paved streets, and other things that are very annoying to the district in which we operate as well as expensive to ourselves.

Mr. Waring—I would like to ask Mr. Goodnow what has been his experience as to the effect on diaphragm meters, and also if he could give us some idea as to the leakage, if it is excessive. Those seem to be the arguments against the system by persons not familiar with it.

Mr. Goodnow—In the use of meters over a period of about 5 or 6 years the drying of diaphragms has not been noticeable. So far as we have observed in repairing and testing meters, the effect has not been damaging, and we do not notice anything particularly different than on the low pressure distribution. We have at one point with which I am the most familiar about 2,000 or 2,500 meters used on gas which has been compressed, and at another point there are about 4,000 meters in a district which is almost entirely direct high pressure distribution. In regard to the question of leakage, I don't think that, on the average, it is more than it is on a low pressure distribution system. One reason for this is that you may have a very large leakage for a short time, but the nature of the system is such that you discover it almost immediately, aud a comparatively small leak will manifest itself more quickly and be more readily discovered than joint leakage and poor workmanship in connection with services on a low pressure system. So I hardly think our experience has been that the average loss by leakage is more than it is on a low pressure system of similar length, although, of course, if you took the diameter of the pipe into consideration it would perhaps figure out differently; but when you take into account the amount of gas transmitted through the different sizes of pipe, I do not think it is. Another little point that has developed in one or two plants is the condensed matter which we have been saving for the last year, which is quite worth while. In transmitting

300,000 feet per day there is a large amount of oily matter which we separate from the water and use in the water gas machine or put in with the oil. This matter taken out appears to be of the gravity of benzole, and consequently is quite a valuable enriching agent when put back into your oil tanks.

The Secretary—I would like to ask Mr. Goodnow if on the direct high pressure system the item of attention to individual consumers is any higher than on a low pressure system.

Mr. Goodnow—You should have a record of it for each meter installed, and the item of repair and maintenance of regulators would be approximately the cost of repair and maintenance of one meter, and in that way your distribution charges are somewhat increased, because you practically have the expense of perhaps two meters in place of one, and the repairs necessary on that might be added in. But I will say that a diaphragm, high pressure regulator for individuals is very satisfactory. It is automatic and requires as little care and inspection as a meter and perhaps less, not any more I am quite sure.

Mr. Crawford—As to the depth of the main, I had charge of a distribution system at Sterling and Rock Falls, Ills., for 3 years. The main was laid across Rock river, which is about 900 feet wide at that point, right on the bridge. We had one insulated joint and two expansion joints, and never had any condensation or freezing in it. The only leakage we ever had was when the service clamps in one or two cases twisted on the main and caused leakage. We had three forms of compressor—the ordinary air brake compressor, the electric compressor that we used all the time, and one other compressor. We found it took 1.2 kilowatts to compress 1,000 cubic feet of gas from zero to 30 pounds. We had 460 service governors installed, and in 1¼ years had only 11 to repair and had no trouble from the main being exposed. We never had a frozen service.

Mr. Averill—On the west side of the river in Cedar Rapids we had very little business and our mains were very small. We were at an immense amount of trouble every winter by our mains across the bridge freezing, and our pressure was very low at the distant points. Last summer or fall we laid a pressure line across the Milwaukee railway bridge, carried it out to pretty near the extreme ends of our mains and connected up half a dozen streets. We find that has helped our pressure so that it is normal on that side of the river. It didn't bother us during the winter. You probably noticed it in going to Marion, running across several bridges. I think there was only one complaint of a freeze-up on the Marion line last winter, and that occurred not very far from the works.

Mr. Lea—In the compression of unpurified gas there is a product of sulphur. I want to know if any tried to compress it; if so, what data there is on the amount of sulphur removed.

Mr. Pratt—I would like to ask Mr. Goodnow to what extent would he give the high pressure systems for the augmentation of pressure preference over augmenting the pressure at different points, here and there, where it might be weak. Say in a town of 20,000 people, having 18 miles of mains, there are several points at which the pressure is weak and needs augmenting. There the expense might be in the neighborhood of $5,000, and it might require the extension of a mile of mains to carry out the high pressure idea. Assuming that the cost would be practically the same as by augmenting the pressure in the old way, would he give the high pressure system the preference on account of his ability to extend or expand it at any future time?

Mr. Goodnow—If that high pressure distribution had no future, if it couldn't be used later on for further boosting or helping the districts which might later on become more thickly settled, on the same expenditure I think I would not favor the high pressure installation. I would rather expend the money, if it did the work equally well, on low pressure; but if it did have further prospective value, I would favor the high pressure installation. I think you have to face the question of cost of compression. Some of us have heard the statement that it was a mere nothing, but it amounts to an appreciable cost in your distribution. We have at some points made an arbitrary charge of 3 cents per 1,000 as the cost of compressing the gas. This is done to cover additional fuel for steam, requiring additional attention at the works and operating machinery, lubricating oil, and incidentals like that. So that if you are going to face an additional cost of 3 cents per 1,000 on an expenditure of $5,000 for construction, I would favor the low pressure installation.

Mr. McLean—I would like to ask Mr. Crawford what type of compressor he uses.

Mr. Crawford—An electric compressor?

Mr. McLean—With that type of compressor the power for compression seems to be 1.6-horse power. That cost would, of course, vary at different works.

Mr. Crawford—There are other items that enter into it—the oil on the compressor, sometimes the water. You have to keep your compressor cool; it gets pretty hot pressing it that high, and takes considerable water. The items of oil, attendance and water would have to be added to that. That current was made from water power and transmitted to the gas works and the gas compressed with that current.

Mr. Olds—What scheme did Mr. Lawlor use for getting away from electrolysis? He is using steel instead of wrought iron pipes. This winter I visited most of the high pressure systems in the East and did not find anyone using steel pipe, but I found a great many places where they were having lots of trouble with electrolysis. I found some very interesting schemes brought out. One line was 34 miles in length—I believe it was a 3-inch line. They were using a check valve at the entrance to the towns, and it worked very nicely. Another system used a valve every 500 feet. I don't know what the practice has been in the West, but it struck me that putting in a valve on the line was a very good idea. One system that I visited had about 20 or 30 customers on a ¼-inch line, and they were selling them 2,500 or 3,000 feet a month. This system had exploded all the theories that had been brought up on high pressure lines.

Mr. Lawlor—We haven't had any trouble from electrolysis on our high pressure line and do not anticipate any. We only cross a track three times in going to Cedar Falls.

Mr. Pratt—No one answered Mr. Lea's question. I have an idea that he can answer that himself if he will.

Mr. Lea—The only place I know of that it has ever been tried is in San Francisco. There they found there is a very appreciable reduction of sulphur, and there is some possibility of using the compressor as a purifier box, I believe. I don't know how far the experiment has gone, and I didn't know but somebody else had tried it.

Mr. Waring—Mr. Goodnow has kindly set aside two objections on dry meters. Two other objections are advanced by people who have not tried the high pressure system. One is the unreliable distribution in case the compressor should shut down, or the possibility of the service being discontinued; the other is the danger of a break in the line of the streets of the city, or even the cellars of the consumers, causing possibly a serious accident. Would Mr. Goodnow give us some idea as to how reliable this system is in his 5 years' experience, and if any accidents he has had would be of help to us in preventing similar ones. A great many of us are contemplating going into this, and we would profit very much by his experience.

Mr. Goodnow—I can say very emphatically about the accident part of it that we have never had any that could be traced to high pressure distribution. The districts in which we have operated have been varied, but have not included a thickly populated part of a large city, or a city as large as this, and we have never had an accident the source of which could be traced to high pressure distribution. As to the question of reliability of supply, of course, we furnish duplicate machinery, and consider that necessary, because in using a steam engine or an electric motor or a gas engine it is liable to go back on you some time. That solves the question, I think, because if your line is in active operation and carrying the peak of the load at 6 o'clock, for instance, or 12 o'clock, the compression in the pipes up to 20 pounds or thereabouts will carry the pressure to the consumer enough to change from one compressor to the other, and you will probably have at least half an hour to do that in. Sometimes you will probably have a great deal more than 20 pounds on your line when your machine goes wrong. There is a point, however, perhaps a more serious point. When a district fed by a main which may be 10 or 20 miles from a plant breaks, you might have to shut your gas off from that particular district. In our experience we have never been obliged to shut the gas off from the whole high pressure system, because our duplicate machine has always been in readiness to take care of anything that might happen. The worst I have known is the cutting off of a small district from a break in the pipe line which supplied that district. That can be obviated somewhat, or almost entirely, by compression tanks in various parts of your district holding a certain amount of gas. These, if placed at the extremities of the system, would tide you over, and in that way if you did have to valve off your line you would have enough gas to supply until a repair could be made. We have a few compression tanks and they have tided us over several times when we have had to repair our line for some cause or other. The net result has been that I don't think we have been out of gas in any of our systems more than would have

been necessary in any low pressure distribution. I think everybody has had the experience of having to shut off a district for an hour or two under low pressure distribution. In regard to valves on the main line, we have made a practice of placing them about every half mile, which has allowed us to cut out half a mile, and the compressor would run it on the works' side during that time and the compression tanks on the other side.

Mr. McLean—With reference to Mr. Waring's question as to accidents, in houses where you have distribution by high pressure do you use any seal or safety device for protection on the house side of the governor in case it should get out of order?

Mr. Goodnow—We do in every case. To begin with we used an oil seal which had an outlet to the outer air, and later on we used mercury seals, which are more compact and easily installed and cheaper in a good many ways. That has protected our meters and our house piping entirely. We have never to my knowledge had pressure thrown on the house system of piping in any case, and the regulators very seldom give any trouble. There is a regulator now on the market which has a mercury seal cast in the regulator, making it one piece, and the installation very simple.

The Secretary—The four principal objections—in fact, the only four, I think—have been pretty well disposed of. Colonel Pratt's question in regard to comparing the two installations I don't think was quite fair, because the high pressure installation does not cost as much as the low pressure. It will not under any conditions, unless you are unnecessarily extravagant. It was brought out at the American meeting at Milwaukee, and referred to in our meeting last year, that, allowing about 3 cents for compression, and figuring the cost of distribution at about the current rates, the point where low pressure ceased to be economical, as compared with high pressure, was when the number of services got down to or below about 100 per mile of main. The reason I asked the first question on the item of complaint expense was because that, to my mind, was the only unknown quantity. If you take the item of complaint expense on a low pressure system and multiply it by 2, I think you will be perfectly safe in applying it to a high pressure system. It brings the economical point to about 95 services per mile of mains. In other words, practically all the cities in the three States represented here, if they could start afresh, would be operated cheaper by putting in high pressure distribution. It is a very interesting point, but I don't think any of us want to do it. I would like to ask Mr. Lawlor a question. In the case where he had the low pressure governor to feed from the high pressure, he says he has a 2-inch pipe seal in oil that will blow at 6½ inches. I would like to ask if they have any indicators to show when that seal blows?

Mr. Lawlor—We have no device by which we could notice this seal blowing, with the exception that with a 2-inch stream of gas blowing in the neighborhood you will very soon know it.

On motion of Mr. Waring a vote of thanks was tendered to the writer of the paper.

Report of Committee on President's Address.

Mr. Pratt, from the Committee on President's Address, read the following report:

Your Committee to whom was referred the address of the President submits the following:

The address contains the substance and meat of much that is interesting and instructive at this time and furnishes food for thought to the members of this Association.

His reference to the advantages of small gas associations is undoubtedly true, for the reason that there is work which the smaller associations can undertake and perform much better than is possible for the Institute to undertake or perform.

The suggestion that, in our desire to secure the sale of our product for fuel purposes, we ought not to lose sight for a moment of its fitness, adaptability and cheapness as an illuminant, is important.

His modest reference to "competing illuminants" savors of diplomacy and tact, inasmuch as the good salesman, in order to find a customer and market for his own product, will not do so by running down the quality and advantages of that which the other fellow has for sale.

It is a peculiar condition of affairs which calls for the reduction in price of our primary product, when the costs of labor and materials have advanced and seem to be continually advancing. There can be but one thought in connection with this, that gas has become a necessity to be used by the rich and poor alike and that our compensation and profits must come from increased volume of business together with a better market and higher prices for our residual products.

There is truth in what is said concerning the attitude of gas companies and other public service corporations toward the public, for the successful manager of this or any public utility is the one who, by his methods, secures and retains the confidence of the community in which he is doing business.

We suggest a re-reading of this address by the members, for it contains much that can profitably be studied and adopted by the successful gas manager. (Signed.) Edward G. Pratt, A. T. Averill, } Committee.

Upon motion of Mr. Kellogg the report was accepted.

The President—The President would have been fortunate if he had had the comment instead of the original for his address. We will now stand adjourned until 1:30 P.M.

Second Day—Afternoon Session.

The President—Mr. A. W. Zahm, who has prepared a paper on "New Business Methods," changed his location recently, on which account he will not be personally present. However, the paper is here, and I will ask Mr. Haines to read it. The author requests that the paper be discussed. It is often the case when the author is not present that the discussion is not so full as it otherwise would be. I hope the members will give attention to the paper and participate in the discussion of it.

Mr. Jansen Haines then read the following paper, by Mr. A. W. Zahm, on

NEW BUSINESS.

[For the text of the paper by Mr. Zahm, see Journal, July 1, page 6.]

Discussion.

The President—This subject of perennial interest is before you. We would like to have the discussion opened by Mr. Roper.

Mr. Roper—This question has been talked over so much that I have taken a new turn in the last few months myself. The ideas hashed and re-hashed of doing this and that by solicitors and advertising and all that have to my mind caused the new business end of the line to grow ahead of the President and managing board of control of the companies as a rule. I can cite one case that has come under my observation where the manager, after being turned down the second time on a proposition that he had thought out and spent months on, finally said: "If they were all pushers instead of knockers what a company this would be." The President wanted to know what he meant, and he told him, with the result that they started in on a booster system. The best thing to illustrate that is a little thing I clipped and showed to several people. When you run across these nice little articles in a paper and cut them out so that you can have them to refer to, if you quote them often enough they generally get to the President:

"Everything comes to those who wait
Is a lie; and I can beat it.
Good fortune comes with white-heat gait
To the man who goes to get it."

Mr. Stewart—I at one time heard a question put to a gentleman who was addressing a meeting of solicitors as to what he considered the greatest quality for a solicitor to possess. His answer was, he thought he could sum it all up in one word—and Mr. Roper came pretty near getting right on to it—"Enthusiasm." I have noticed that many solicitors and gentlemen connected with the new business departments of gas companies know a great deal about all departments of the gas company and thoroughly understand the manufacture of gas, but at the same time were very poor solicitors and got very poor results. The reason for that was simply because they didn't have enthusiasm. It has been my experience that the solicitor who gets the business keeps up enthusiasm, and you must let him know that you appreciate his work, for otherwise he doesn't get that enthusiasm, and if the management doesn't pay any attention to him—if he goes out and has a good month and nothing is said about it—he feels that his work is not appreciated. We all like to have our superiors tell us they appreciate our work. I have been connected with two companies and found that those men at the head of the new business department of the gas company that get the very best results are men who keep in personal contact with their solicitors, and when they have good results do not hesitate to let them know their work is appreciated. I don't believe any other department in the gas company is as important as the new business one, because when there is no new business being done everything else lags along. A good solicitor will not only get new business, but will keep his old business in good shape. Another good plan I have noticed followed by solicitors is that after a sale is made they keep right after that customer for a month or two, no mat-

ter whether the sale represented a water heater or a gas stove. Having visited the house once or twice after the sale has been made, the solicitor will find something the lady of the house didn't tell him on his first visit, which he is able to rectify on the spot oftentimes. At Waterloo whatever success we have had came simply through getting right down and working hard. We divided up the territory and made a canvass of the town, finding out everybody who wasn't using a gas range that was within reach of our mains. Then we adopted a system of writing letters, following these with a personal solicitation by a solicitor, who turned in a report of just the conditions that he found. Then we wrote another letter covering the difficulties encountered where he didn't make a sale. After making a sale a complaint man (rather, an adjuster) adjusts the stoves and sees that the users know how to handle them. Then we have a lady demonstrator, whom we taught what she knows about the business, call on the consumer about a week after the stove is installed. Having spent possibly half an hour with the lady of the house, we find that our representative has been greatly appreciated by the people with whom she has conversed. This year we had a demonstrator who has been giving lectures all over town, and have adopted a rather novel plan. We have a large tent, having a floor made in sections, on which we can seat comfortably 70 people. We can, however, by putting chairs in the aisles take care of 100 nicely. We move that tent every week, which enables us to get into any neighborhood, and our average attendance has been over 800 every week. I know it is the best thing we have ever done, and think it is the best thing any gas company can do to stimulate goodwill and enthusiasm. Get the people to think about using gas, and let them realize that the company has their interest at heart. One of the greatest difficulties in selling gas to new consumers is that the public is under the impression that the gas company and everybody connected with it are robbers. I have often illustrated it to my own mind something like this: If there were only one grocery store in the city, with only one pair of scales, which were owned by that groceryman, and he was selling granulated sugar at 40 pounds for $1, we would possibly think we were getting short weights handed to us, simply because we had no way of weighing that sugar when we got it home. At the same time we would figure if that groceryman had a competitor we would possibly be able to get 50 or 60 pounds of sugar. We have the only gas company in town and the only measuring instruments, and they virtually have to take our word for it. Can you blame them for sometimes feeling they are held up? As an experienced solicitor I don't blame them. When the public are placed in that position they have to be handled with care and judgment, and one of the greatest drawbacks to new business is oftentimes the other departments of the gas company. The consumer will often come down to the gas office with some little complaint that doesn't amount to anything, when somebody gives a short answer and treats the consumer as if the company didn't owe them anything. They tell a neighbor who doesn't have a gas stove, and we get out and try to sell to the neighbor. The new business department feels that more quickly than any other. I have found cases, too, where it seemed as though the management didn't take up those cases properly. Another thing. After a gas stove is sold the people want it installed right away, and when they make inquiries at the office too frequently some of the employees will answer the 'phone. They thoroughly understand that the company have all of the work they can do, and they think the lady ought to be patient; but they don't realize that she doesn't understand the conditions that exist and don't give her the proper answer, and when the stove is installed she is sore. Those are things that should be looked after very carefully. Another difficulty comes from employees in other departments, who try to answer questions about matters that they don't know anything about. A lady will say to someone—possibly the man reading the meter: "I think my gas bill is too large this month," or something of that sort. Too often he will answer: "Well, I think it is pretty big, too; there must be something wrong with the meter." The result is that the woman is right up in the air, for she is satisfied she is being robbed, because somebody working for the gas company has told her those things. Regarding gas stoves, employees will sometimes recommend this or that stove, and when the solicitor comes around he will try to sell something else; but she must have just what that man told her, because she has more confidence in him than in a solicitor. Those things can be eliminated if the proper effort is put forth. In Waterloo we have a splendid organization. Every employee seems to be trained right along those lines Once in a while, however, we have to hire a new man. For instance, we have a new collector, and he has made several of these very same statements that I have repeated here and they have caused us trouble. We haven't had time to get him "properly organized" and trained. At St. Louis, before the company was large, that was one of the great drawbacks to our new business department—statements being made by employees when they didn't know just what they were talking about. Regarding Mr. Zahm's paper, he states that the solicitor did not need any particular training, but I take issue with him on that. In 11 years' experience I find that almost every day I work I learn a great deal about the gas business. I think the solicitor must be a good judge of humanity. He must know exactly how to talk to every consumer with whom he comes in contact, and hardly two of them you can talk to along the same line. You must be able to read the man and talk to him in his own language. I oftentimes in going into a house try to get on the level of the people I am talking with. If I go into a very poor man's house, where things are unclean and the man possibly does manual labor, so has not had an opportunity to read and keep posted, possibly has no education at all, I frequently go to the extreme of making it appear that I am embarassed myself in talking to him, in order to get the man to feel at home and tell me what he thinks. In other words, I try to be just on equal terms with the person to whom I am talking. If I were to go to the president of a bank I would adopt entirely different tactics. I would certainly let him understand that I thoroughly knew the gas business in every detail. I have had good results by putting some of those ideas into practice. Again, when a solicitor goes to a house already fitted for gas, if he finds any little complaint that he can't rectify on the spot, he should turn it in to the office and keep right after it to see that it is properly taken care of. We keep after every gas stove we sell to see to it that it is properly adjusted. If the man who attends to such work has not adjusted it we report to the superintendent, after which we see that it is done, and we have had good results in Waterloo.

Mr. Martin—I don't know that I can say anything more than the gentleman from Waterloo said. I have been a corporation man all my life, and got into the gas business something like 2 years ago. As to clerks making short, sharp answers to questions, let me say nothing of that kind occurs in Omaha. I never saw a bunch of men together that would do each other's work when necessary, or treat the public with any more civility, or do more to help the new business department arrive at results, than the employees of the Company that I represent. However, once in a while you get a solicitor on the street that is not properly posted. His first essential is to have knowledge before he goes out to sell the goods. I recall one man our Company had since I have been with it that could get out and sell more gas stoves than ony other two men in the Company. He was a world-beater as a salesman; at least you would think so from his reports. He was with us probably 2 or 3 months; but we found after we let him go that he would make exaggerated statements of what the different appliances would do as to the consumption of gas or the length of time it would take to bake a certain thing, which afterwards the consumer by experience would find was untrue. This would leave a bad taste in her mouth and come back to the Company. It took about 90 days to straighten out what that man had done in 60 days. He made terms that he had no authority to make, because he was not properly posted, and made these statements because he didn't actually know what the appliance would do. He would make believe in the office that he was a four-flusher, and would gather up information to make us think that he really did know about these things. One day while in the hall talking to another solicitor (it seemed this solicitor did know his business) he told him he ought not to exaggerate things that way. He turned around to him and said: "You show me a man that won't exaggerate at times, and I will show you a man with 40 patches on his pantaloons." Well, now, that is not a fact. A man can go out and sell goods on their merits and make them stick, and do business that is satisfactory to everybody, where another that will do as this one did will create trouble, as I said before, that took us 90 days to straighten out. In the matter of a demonstrator, I don't think it is well to send one out to follow the sale of a new gas stove. Mr. Clabaugh instituted a postal card system in our Company. He sent out a card with a reply tag attached to it, which the party can return to us if she is in trouble of any kind, then the demonstrator calls on her and gives her all of the information she desires. Once in a while the man of the family gets those cards, and not thinking anything about it will sign his name to it and send the card back to the office. Of course we don't know but he has taken it up with his wife, and the demonstrator will go out there and get into the biggest kind of a fight with the housewife or the maid. The lady of the house will say: "Don't you suppose I know how to run a gas stove? You needn't

come out here and tell me how to run my house or my stove; I can do it as well as you can." She will get a similar answer from the maid, if she happens to see her, and I know in one case the maid quit because the lady of the house sent for the demonstrator to come out to tell the maid how to run the gas stove. So I think it is best to be a little careful about sending the demonstrator out right after the gas stove has been sold.

Mr. Stewart—I would like to ask the gentleman if he thinks their demonstrators are properly trained? It appears to me that a demonstrator with the proper training and intelligence along that line would have more diplomacy than to offend a woman when she went to the door. I think we had but one case out of 1,200 in which any offense has been taken that was reported to us, and our demonstrator has positive instructions to report anything of that kind. She doesn't go to the door and say that she has come to tell them how to run their gas stove. She tells the mistress in a very ladylike manner that she has called to see if she is getting along nicely and how she likes her gas stove. She often has trouble to get into the house, but she goes at it in such a way that I can't conceive why a consumer would feel that she had come there to tell her anything that she didn't know. If the demonstrator uses reasonable diplomacy and good, sound horse sense, there is no reason that she will cause feeling to exist.

Mr. Martin—Regarding the postal card which we send out, I mentioned that the husband had sent the card back to the gas company without the knowledge of the wife or the maid. Our demonstrator called at the house and stated the nature of her business, which, of course, she necessarily would have to do, and what she could do outside of that I don't understand, but it was sufficient reason to start this row, neither the lady of the house nor the maid knowing anything about it. In the other case the lady of the house sent back the card and when the demonstrator called she found the former was out, but the maid was at home, and that started the row at that time. We have a woman with us who can show them all how to get around, but she couldn't help what occurred; it was utterly impossible.

Mr. Waring—The facts of the case are about like this: In Omaha everybody knows how to use a gas stove; in St. Louis and Waterloo probably they need training.

Mr. Maple—Isn't it a fact that local conditions govern a great deal? In Boone possibly half of our residents are farmers who never saw a gas stove; in fact they are afraid of it. An instance that happened a few weeks ago. A father and son who lived next door to each other ordered the gas in at both places, provided we would set the meter out-doors. We told them we couldn't set one out in the yard, and they went to the expense of building a little house in which to put it. That shows you what they know about gas. In Omaha probably they would never have a case like that in a 100 years.

The President—It is all right for Boone; but Waterloo is a city.

Mr. Martin—The southern portion of our city is inhabited largely by Bohemians—a close-fisted lot of people who always have money somewhere, and most of them own their own little homes. There the houses are as thick as can be, and nobody that ever went there had any success in getting consumption. I remember one instance where I went to canvass for a main extension. At every house they didn't speak English, couldn't understand me, and wouldn't have anything to do with me. I was finally about to give it up, but as I was walking back I found a man who could speak Bohemian. I asked him if he would go with me a few minutes, that these people were either afraid of me or they wanted to get rid of me. He hesitated some but finally consented and I took him over to a saloon and bought him 2 or 3 glasses of beer. I went down the line with that fellow and put 28 gas stoves in on that extension, and it was all done through that Bohemian. If I hadn't gotten him I would never have put in a gas main. A great many of these people couldn't speak English, in which cases he acted as an interpreter. However, others were there who could talk as good English as I could, but were afraid of me. They thought I was a tax assessor.

The President—I think the Secretary will be duly authorized to extend the thanks of the Association to Mr. Zahm for his paper. It certainly has produced an enlightening discussion of the subject.

Mr. Pratt—Mr. Roper has handed me this clipping which he would like to have added to his remarks. Shall I hand it in without reading?

The President—I think it could be read.

Mr. Pratt them read the following clipping:

"The art of talking is one of the most valuable equipments a business man can have. Nearly all work that is above mere routine and physical labor involves talking, and the success of the work often depends on the ability to carry the point in conversation. The difference between skilled and unskilled talkers is very great. The importance of knowing how to talk well is not generally appreciated. Many who think they are deficient in the art are as self-deceived as the novice in poetry writing. Really skilled talkers are rare, because little or no systematic attention is paid to cultivating the art. Instead of being allowed to develop in a haphazard manner, picking up a point here and another there, talking should be the subject of study almost as thorough as that given to painting, writing or music. A man may have good ideas, but if he does not know how to present them intelligently they may never attain proper recognition. If a man would acquire information from others he must know how to draw them out. The difference between a good salesman and a poor one is often a matter of knowing how to talk. And the manager who gets the most out of his men is the one who knows how to talk to them in a manner that will stir their enthusiasm, quickening and encouraging them to put forth their best efforts. At every turn the art of talking is a vital factor in success."

Mr. Pratt—I might add in connection with this that I know Mr. Roper lays a great deal of stress upon these articles on "Thoughts on Business" that appear in the Chicago *Record-Herald*, and I think he has a scrap book in which he keeps them all. There is a great deal of meat for thought in them. An article of that kind comes out every day.

Mr. Clabaugh—I would like to say that they are also published in the Omaha *World-Herald*.

Mr. Stewart—The *Daily Times-Tribune*, of Waterloo, also publishes them, Mr. President. [Laughter.]

Prepayment Meters.

The President—We have some short topics for discussion, amongst which I notice "Prepaid Meters." I will ask Mr. Crawford to give us his experience on this subject.

Mr. Crawford—My experience with prepaid meters has been very successful. In Clinton 2 years ago we had about 100 of them set which were originally gotten only because some of the consumers were dead beats. That has not been my experience with them, and so when I took charge there we commenced to put them in. We had rather hard sledding with the first 100, after that we kept on putting them in gradually until this spring we have in the neighborhood of 900. We used to have an average of 22 complaints a day on gas bills on consumption from the 1st to the 15th (our discount day is the 15th). At the present writing the complaints average about 1½ a day. Perhaps 400 of these meters were put in on dissatisfied consumers who thought they were not getting the gas they were paying for. When I left yesterday we had 150 applications for changes from ordinary to prepayment. We sold 267 ranges up to yesterday morning so far this year, and everyone of the purchasers demanded a prepayment meter. We haven't for the past year bought anything but prepayment meters. I took 600 of the dissatisfied customers with the ordinary meters and averaged their bills at $1.40; but the same 600 on prepayment meters averaged $2.30. The people are better satisfied. As one man stated to me, "The only trouble with the gas business is that you have it all in your own hands. We have to buy the gas from you; you are the only man that sells it, and it is a little bit unsatisfactory. We can put a quarter in the meter and see that the indicator runs around 250 feet (we sell gas at $1 per 1,000) or we drop 2 quarters in and see it run 500 feet. We watch that hand go back, and we know we are getting what we pay for." One hundred of those meters were put in for people who ordered their meters out on account of dissatisfaction in the amount of gas consumed. We get everyone of them back with the prepayment meters. Up to yesterday morning we had, I think, 3,067 meters set. We have one man who does nothing but put prepayment attachments on ordinary meters. We have the meter company send them to us in lots of 25 about every 2 weeks. We hope eventually to have about 75 per cent. of our business prepayment meters. I am interested in a small plant in Morrison, Ills. There are 480 meters there, 420 of which are prepayment. There isn't another appliance that will make customers better satisfied than a prepayment meter, and they are a good thing for the Company. The Company gets its money in advance. I have heard objections to them on account of robberies. We had 4 broken open in the last 2 years. We have each applicant sign an application guaranteeing the amount of cash that is in the meter; that is, if the meter is broken open the customer is liable. On two of those occasions the consumers themselves robbed the meter

and got out of town, in the other two the consumers settled for the loss. On that number of meters we should have anyway 4 per cent. of uncollected bills. Supposing we had one or two losses, we would be ahead in the end. I think from our experience the prepayment meter is the only one to install.

Mr. Kellogg—I think the gentleman overestimates the loss there should be on gas bills. I think 1 per cent. is nearer the figure than 4. Our experience with prepayment meters does not harmonize exactly. We commenced putting them in, as he did, with dead-beat customers. We gave them that reputation when we started purposely, but finally people began to want them and we kept putting them in. About a year ago we had out 800 prepayment meters, the highest number we have reached. Since that time we are taking more out than we are putting in. The office has a list of excuses why they shouldn't use them. If a customer comes in and wants one, we ask him why. "Well, So-and-So has one and we want one, too." We tell him we are taking them out. I forget the list of reasons, but one is that if you have $10 in the house and haven't a quarter, you can't feed the meter. Another is that a lady puts her bread in the oven and goes upstairs to sew; 5 minutes after she has gone the gas shuts off. She comes down in half an hour to take her bread out and it is spoiled. We have something over 8,000 meters all told, and I know we have less than 800 prepayment meters.

The President—Mr. Hunter, can you tell us something about prepayment meters with your companies?

Mr. Hunter—I have had very little experience along that line that has been satisfactory, and really know very little about the entire working of a prepayment meter. When I first commenced in the gas business we used them very largely, but before I left that place—not through myself, however—we changed all over to straight meters. I have been in other companies where they found them satisfactory and pushed them. As far as I can judge from the two gentlemen who have spoken it is a matter of being able to talk your consumer out of what he wants and talking him into something you want him to have. That would lead to a lengthy discussion on salesmanship, which is not under discussion now. I say everybody connected with a gas company who comes in contact with the people ought to know what the management wants and see that its customers get it. I have seen offices where one man would talk one way and another another.

Mr. Crawford—We have never had an accident. When the meter is installed the man who sets it makes the person in the house responsible, showing him the action of the meter and telling him the result. We solicited the first 100 meters and worked hard to get them in. The second 100 we put in for people that had ordered meters on account of dissatisfaction with the bills and lack of confidence in the honesty of the gas company. Since then the meters have been ordered without solicitation. Of course, I know people who object to them on the grounds Mr. Kellogg has stated; but most gas men I have come in contact with recently talk prepayment meters.

Mr. Haines—This has been a very interesting discussion. We have quite a number of prepayment meters in Des Moines. At one time we adopted the policy of charging the consumer $1.50 for the change from one form of meter to the other. We did that in an endeavor to keep down the number of prepayment meters. It was getting rather difficult even then to keep them from changing, and it created a great deal of unpleasant feeling. We made an investigation to find whether the prepayment meter, including the cost of investment, was really a cheaper investment than the standard meter, and the figures were if anything favorable to the prepayment meter, taking everything into consideration. So we changed that policy, and at the present time when a customer comes in and inquires for gas he is given the option of choosing whether he will have a standard or prepayment meter. If he wants to change from one form of meter to another he is permitted to do so without charge. By giving the customer the option in the matter we find he is better satisfied. I think the prepayment meter has come to stay, and when we talk against it I think we are talking against our own interests. We should make it understood that the customer gets the same service from both and that he should have whichever he desires. As to accidents. I have investigated many cases of asphyxiation in a number of places for several years, and my firm belief is that in 90 cases out of 100 they are suicides. Very often, for reasons of policy or misery, these deaths are referred to as accidental, but if investigations were carefully carried on to bring out the real facts of such case, 90 out of 100 would be proven cases of suicide. Occasionally a case may occur traceable to a prepaymont meter, but these are very rare. As to robberies. We had those which were apparently the operations of a systematic gang. They annoyed us considerably at one time—I think the pilferings ran as high as $100 a month, and while we were able to collect from the consumers nearly all of that money, it nevertheless caused much ill feeling, for naturally the customer hated to pay twice for gas. It is not a difficult thing to detect robberies, which are unlike petty pilfering in the drygoods business or any other kind of business, as the sneak thieving of the money boxes resembles; but I believe that it is impossible for men to systematically rob meters without being convicted. We had the good fortune to catch every such person without difficulty in Des Moines. One man was sent to the penitentiary for 5 years, one to the city jail for 6 months, another for 3 weeks, 2 others were made to settle with the consumer, and 1 man is under indictment now. The man who went to the penitentiary had been robbing the meters after 6 o'clock. We watched his operations for some time with perfect confidence that we would catch him sooner or later, and our confidence was not misplaced, because he was detected and indicted on several counts, and the judge gave him the maximum sentence for breaking and entering. I think if any of our members are so troubled they will find that, by careful investigation and the employment of a good man, in a few days they can very easily catch the person. They nearly always leave some indication behind them as to who they are.

Mr. Kellogg—Don't understand me as opposing prepayment meters. I think they have come to stay. Our thought in handling them was to cause them to come into use gradually, along with our increase in business, for we would not keep our standard meters idle, accordingly we adopted the policy that Mr. Haines referred to of charging $2 for a change, which seemed by-the-way a reason to the consumer that there was some advantage to it, or else we wouldn't put on the penalty. The consumer never realized it would cost us $2 to make the change. Finally we decided that it was bad policy to keep up the penalty, and we cut it off. Immediately after that was done the demand for prepayment meters ceased. The act seemed to impress the customer this way: "Well, I guess there isn't anything in it, because they would just as soon put them in as anything else; and we don't care whether we have them or not." That is our experience. We assume that the prepayment meter will grow, but we don't want it to grow faster than our business so that it will put out of service our standard meters.

Mr. Crawford—We have heard much about the new businees department at Waterloo. I would like to know what they do about prepayment meters.

Mr. Stewart—We are putting out prepayment meters, handling them very much as the gentleman from Des Moines stated, and let the people choose which meter they want. Our experience shows that the consumption on prepayment meters is smaller than on the ordinary meters. We find, too, that a customer dissatisfied with his gas bill by the regular meter, when changing to the prepayment, ceases to complain. We are not losing any money on them. We had 3 robberies in the last 15 months.

Mr. Haines—Does not the gentleman from Waterloo consider that because the consumption on the prepayment meters in his city is smaller than on standard meters is due to the fact that the prepayment meter reaches a class of consumers who use a small quantity of gas?

Mr. Stewart—No, sir; positively not. Some of the best consumers in town are using prepayment meters.

Mr. Haines—The prepayment meter has often been used to push the gas business with small consumers who couldn't be obtained otherwise. The impression has sometimes gotten out among the gas people that the consumption was smaller; but I do not believe that is universal. In a case where a consumer kicks because his bill is too large, it often happens that the prepayment meter won't pass as much gas as the standard meter did before, but I think it is also due to the psychological effect on the consumer. I think the latter has a great deal to do with it.

Adding a Kindred Topic.

The President—Gentlemen, a kindred topic is "Removing Meters vs. Shutting Off Gas: With or Without Lock Cocks." We had better consider that along with the topic now under discussion. What does Mr. Kellogg do about that at Sioux City?

Mr. Kellogg—We do not use lock cocks. We put a solid gasket in the meter very often instead of a washer. As to whether we will leave the meter shut off. In certain neighborhoods we do or do not. It seems that is a question governed largely by local conditions. If we should leave a meter in an empty house we would be liable to lose the meter-connections, stopcock and all; therefore we don't leave those in. In the better residence district we feel perfectly safe over leaving them in, but we always shut them off at the stopcock.

The President—We are up to the subject of "Purification" and should like to have Mr. Waring start the discussion.

Mr. Waring—I hardly think I am qualified to discuss this subject after my remarks at the last meeting of this Association, in which I stated I thought the operation of purification was not worth the time to discuss it; that if the subject for discussion were purification construction, the cost of an economically constructed purification plant was so small in comparison with the cost of installation that the whole time should be spent in discussion of installation. I presume that this is purification operation and not construction.

The President—I take it that it is intended to be a comprehensive term here, the whole question being what is the ultimate cost of purification—whether an investment or an operating cost; and it refers not only to cost but to results in the quality of gas. For example, Mr. Waring, you are manufacturing water gas, and the questions of condensation of your gas before it reaches the purifier, the removal of tar, oil and vapors, are those that have close relations to purification.

Mr. Waring—I thought that that was separate from this, for the reason another subject, "Removal of Tar," was under another heading, and by its classification there presumed that the question of purification merely dealt with the removal of sulphureted hydrogen. I realize that the purification of gas deals with the removal of all impurities, but the question of removing sulphureted hydrogen from the gas, to my mind, where your plant is already in operation and you have nothing to do with the construction, is very simple. The literature on this subject is so complete that it is almost as voluminous as that upon the question of the removal of naphthaline. May I ask a question in regard to this subject? "Has anyone here been able to remove all the sulphureted hydrogen from the gas so that continuous tests show no stains on acetate of lead?"

The President—I doubt if anybody can answer that, for I doubt if anybody has tried a continuous test.

Mr. Haines—I don't think I quite understand what the question is under discussion. The general subject of purification of gas is a very elaborate one to go into, and it seems that none of us like to begin. I think in a broad sense it is a most important thing for the smaller works to pay more and more attention to from year to year, because it is to the interest of their consumers and also to the gas business in general the sulphureted hydrogen should be removed. As Mr. Waring said, it is largely a matter of construction of purifiers. If some of the smaller plants particularly were to construct their purifiers of sufficient size, I think there would be less trouble in removing their sulphureted hydrogen; and it is obvious there should be a very material reduction in their expense. The cost of production is not only in dollars and cents per 1,000 feet of gas sold, but it may almost be considered in the light of another unit—cost per bushel of oxide handled—which is only one way of getting at the same result. But with the construction of relatively large boxes, the cost of handling the oxide per bushel is materially reduced, since, for one thing, it is not handled as often. The thorough removal of tar before the gas enters the boxes is also a considerable item in the cost of handling the oxide per bushel, because it permits a more rapid and easy revivification of the oxide. I think the question is more for the local manager to study. There is ample literature on the subject, and there are the opinions of very excellent men to consult in regard to the capacity of the boxes necessary for a given plant.

The President—"Minimum Charges" is a topic of interest to somebody in the Council. Mr. Averill, what is the practice of your Company in respect to minimum charges?

Mr. Averill—Fifty cents per month.

The President—Without regard to the size of the meter?

Mr. Averill—Yes, sir.

Mr. Maple—We have abolished that at Boone. We had quite a few complaints from people that seemed to be very well posted on what our franchise stated, etc., and it caused quite a good deal of discussion. We found that the difference between the actual consumption and the total amount of the minimum charge only amounted to $4 or $5 a month, and it was hardly worth while to create this discussion and dissatisfaction among a few cheap people for that amount of money. The electric light competition also made some little capital out of it, saying that they didn't have a minimum charge.

Mr. Clabaugh—I would like to ask Mr. Averill what charge he would make to a consumer who would burn $10 a month in his house but at his office down town only 25 cents a month. Would you charge him 50 cents?

Mr. Averill—Just the same. Of course that 50 cents takes the same discount as the other.

Mr. Maple—We have the same thing—doctors, who only use the light a little, who say, "We are good consumers at our house, but you make us pay for something we don't get down town." We had discussion of all kinds over these little matters, and that is one reason why we abolished it.

Mr. Averill—We haven't as many office meters to-day as we had 10 years ago. We have discouraged as much as we could the putting of meters in the offices where they were not used during the summer months. It didn't pay us to have a meter out.

The President—Gentlemen, we next have the paper by Mr. G. I. Vincent, of Des Moines, Ia., on

STANDARD METHODS IN SERVICE, METER, APPLIANCE AND HOUSE FITTINGS.

[For the text of the paper by Mr. Vincent, see JOURNAL, *ante*, p. 2.]

Discussion.

The President—Has Mr. Lawlor any remarks to make on this subject?

Mr. Lawlor—I don't think so, for the paper is along standard lines that practically all are following.

Mr. Goodnow—I noticed a drip for a service which is new to me and which I think is excellent. The general plan is a little different from anything I ever saw, and seems to be simpler and easier to install. It seems to me especially that, putting the drop in on a double elbow, is an ingenious method which I never happened to see. The device of only having one lead connection to meters is good. We did not always use it, but have for several years, and it cheapens the installation. It gives plenty of expansion, or room, to have a meter moved a little bit without tearing the connections loose, and I think that was proven in practice excellent. No attempt to cover the high pressure service has been made here. This morning a remark was made about what a ¼-inch pipe would do under high pressure distribution. It has not been our practice to use any less than ¾ services. We think in a great many cases ¾-inch pipe would carry all that is needed, but the material is so light in a small pipe and the walls so thin that we have never considered it advisable to lay anything smaller than ¾ inch. We have tried enamelling that pipe with 2 coats of enamel, and last year we installed nearly all our high pressure services with enamel on the outside, and are awaiting results as to what the life of it is. Of course that must extend over quite a period to find out. We have put in ¾-inch services only, and taps as small as ¼ inch with a diamond-pointed drill. The ¼-inch tap is large enough to supply the ordinary customer when it is attached to ¾-inch service. We have put as high as 200 mantle lights on a ¾-inch service with ¼-inch tap, and the average pressure at that point was run down as low as 10 or 12 pounds; but a pressure above 10 pounds maintained the 200 lights satisfactorily.

Mr. McLean—Mr. Vincent, I notice here Section 16 [quoting]. Is there any reason for that except the difficulty of finding fitters who know how to make bent outlets?

Mr. Vincent—The difficulty is they will make short bends and the weld in the pipe is very apt to open. Some of the fitters would bend them with the seam up, so that if it did split they could cement it, which would be beyond the observation of the house pipe inspector, and make a tight joint which would subsequently leak.

Mr. McLean—If a drop is made on the fitting you may turn the fitting in the drop, but if you have a bent pipe that is fastened to the joint you can't turn it.

Mr. Vincent—Your idea is that when you screw a fixture to a drop made in the standard manner, when you go to remove the fixture you may turn the nipple out. That has occurred in my experience, but I don't think it should with the proper fitting. The house pipe should be so tight that it couldn't come out, and even if it does, it is readily put back again. I would like to ask Mr. Goodnow if he uses a swing joint on high pressure service?

Mr. Goodnow—Yes, in certain ways. We use a device called a combination saddle and tee that we found to be the best thing. That is cast in one piece with a plug at top, then the outlet looking along the line of the pipe, and the street elbow screwed into that, which swings one way. We found it much better than to use the ordinary saddle and two elbows or a tee and an elbow. It is a very strong construction and is not liable to be broken. When we first started on that the idea was to put in a cock at that point, but we found it a great source of weakness. That brass cock screwed into the saddle was a very weak point, for when the strain came on the service it would pull it right off, so we abandoned the use of a cock at that point altogether and put in this combination saddle. It forms an emergency

valve, too, even on a high pressure, for by digging down and taking the plug out you can drive a pine plug through the tap into the main, forming an emergency shut-off very easily, at a minimum of expense. It is a very much stronger construction too.

Mr. Vincent—When Mr. Goodnow installs high pressure service does he put the saddle on and drill the small hole in the main through the tee? If the main is under high pressure, how can one put the screw plug in the top of the tee?

Mr. Goodnow—It is not difficult. You have a ¼-inch hole, and as the gas is coming through a ¼-inch tap in the main, it doesn't raise enough pressure so that it is difficult.

Mr. Waring Possibly that, Mr. Vincent, is the direction in which the street tee should be turned on a grade. That mistake has been made several times. The street ell going into the tee should look up hill; if it looked down hill he would have a trap at that point. Of course I know Mr. Vincent knows how to do that, but I merely call attention to the fact. Mr. Vincent stated he did not use any unions in concealed work. I infer then that he does use them in unconcealed work. Our practice in Omaha is not to use any union. We have found that they are a source of a great deal of trouble, as the long screw answers all of the purposes and is a much better fitting. It never gives us any trouble. As to iron connections, we connect all meters with them and have some trouble with straining in changing meters on smaller sizes, but this is becoming reduced as the men become familiar with the work. We have ordered and have now 100 offset pieces or swivels that are made and will be furnished by the manufacturers of meters at no extra charge, and these offset pieces on the outlet can be adjusted to fit any reasonable difference in size in the meter being changed, together with the standard connection, as shown by Mr. Vincent. He spoke of the temporary stopping of pipe with cement. I would like to know if he has his house piping tested under pressure? It seems he would detect any cement work that might be done.

Mr. Averill—Wouldn't it be a good plan to refer this to a committee of three to report at the next meeting, and, if they thought advisable, to adopt a standard? It would save us a lot of trouble with plumbers who are inclined to put in too small sizes. Up to the last year or two our Company inspected all piping, but the city has taken it out of our hands. We did it free of charge—that is, house piping; but now the city is doing that work, and we think with incompetent men, for the sake of making a little fee on the side. To get this before the house, I would move that this be referred to a committee of three to report at our next annual meeting. [Seconded.]

Mr. Waring—I would like to say, in regard to making standards, it doesn't appeal to me that this Association ought to go too far in it. We could possibly go so far as to recommend standards to the Institute, but it would be rather inconvenient to the gas fraternity to have different standards adopted by different local associations, and I should think that it would be much better to recommend to the Institute the adoption of certain standards, if at all, than for this Association to attempt to start it.

Mr. Haines—I think Mr. Waring is right in what he says, but it would be an excellent way to bring this matter before the American Gas Institute to have such a committee appointed. If they have a year in which to report back to this Association, they could embody in their report their communications with the Institute as to what is advisable to be done at that time. It would be unwise for us to sit here and adopt a standard without consultation and the benefit of the experience of all the men outside of the Iowa District Gas Association; but I believe that a committee on standards of that nature would be beneficial to the Institute and the gas fraternity in the three States embodied in this district.

The President—You have heard the motion that this paper and the subject to which it relates be referred to a committee to report its recommendations at the next annual meeting of the Association. All in favor of the appointment of such a committee will please say "Aye." Opposed, "No." The motion is carried. We would like to have Mr. Vincent close the discussion.

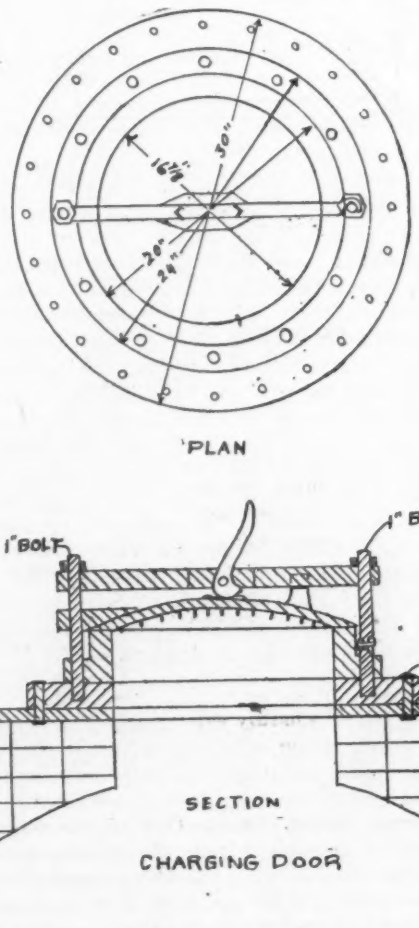
Mr. Vincent—I was familiar with the question of the ell on the swing joint of the service being placed up-grade, but omitted it from the paper inadvertently. This also applies where side connections are made to the main. Sometimes the fitters will leave the tee turned down so that it is actually a trap in the service; in fact, I recently uncovered such a connection. As to the use of unions in concealed work, I believe that that rule was intended to allow the gasfitters and plumbers to connect appliances with unions. Personally, I don't approve of unions in gas work under any condition. I believe we get along a great deal better by using long screws. Mr. Waring suggested that if the house piping were tested after installation under pressure the cement would be detected. It will not show. You can test up more than 10 pounds pressure and it will not leak, but is quite likely to be cracked off by subsequent jarring. In my recommendation that a committee be appointed, I had in mind, of course, that the work would not be made standard by ratification of our Association, because I felt as a District Association we were more or less subsidiary to the Institute; but a great many things might be practical in our cities of the West that might not be satisfactory in other cities, and as more or less of this kind of work has been done in Eastern States it seems to me it would be a good thing for us to place ourselves on record that fitting such as we show is used in our practice, and have the matter taken up with the Institute on that line.

The President—Gentlemen, we will appoint the committee a little later. Mr. Mitchell, we are ready to hear from you.

WRINKLE DEPARTMENT.

Mr. Mitchell—I would like to say, Mr. President, hearty co-operation is the only thing that will make the Wrinkle Department successful, and I don't believe I have had it. Also, the time has been much shorter than anticipated. I have four Wrinkles which I will read:

No. 1.—*A Cam Bar for Closing Generator Charging Door.*—The following device has proved very useful in replacing the old hand screw and cotter bar of the generator charging door on water gas apparatus. Instead of using a cotter bar, tapped for a hand screw, the bar is slotted and a forged cam inserted in the slot and pivoted on a bolt running through the cotter bar. This cam is so placed that when its long arm is approximately vertical it relieves the pressure on the lid and allows the cotter bar to be swung to one side and the lid removed for opening. When the lid is replaced over the opening, the cotter bar may be swung across it in the usual position and the long arm of the cam pressed down as far as it will go. I have had considerable trouble in the past in having the gas makers break off the hand screws on the cotter bars by striking them with a hammer in order to tighten them up. With the cam, as shown on the inclosed print, there is nothing to break except the bolt on which it is pivoted,

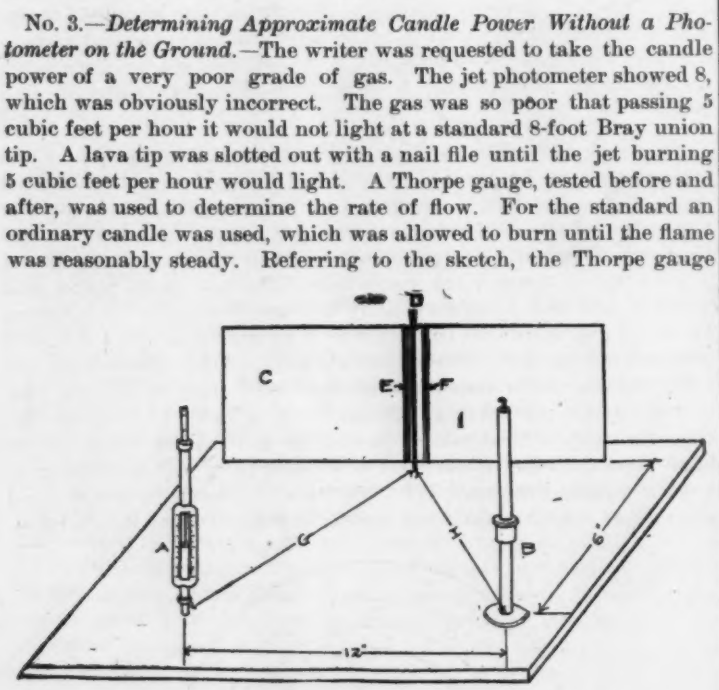


and that may be easily replaced. I have found that while the men usually drive the cam down with a heavy iron bar, there is very rarely

any breakage with it, while at the same time it can be operated very much more rapidly.—JANSEN HAINES, Des Moines, Ia.

No. 2.—*Supplying Warm Water to the Ammonia Washer.*—I give below a description of a small appliance I got up several years ago for the purpose of avoiding the choking of the ammonia washer, the cause of which I attributed to be the use of cold city water in the washer, which precipitated naphthaline and filled it up in a short time. The scheme I used was to place a small water tank, of about ¼-barrel capacity, on top of the scrubber, which was near the ceiling of the building and in a warm temperature. By using a float inside of this tank the water was admitted into the tank gradually and only as fast as it was drawn out for the use of the ammonia washer, which amount of water was regulated by a small valve and a sight feed, so that it could be easily seen how much water was being admitted to the washer. As the washer requires very little, the water was brought up to the temperature of the scrubber before being used and the trouble overcome. This is a very inexpensive appliance and is well worth the outlay.—GEO. S. CARSON, Iowa City, Ia.

No. 3.—*Determining Approximate Candle Power Without a Photometer on the Ground.*—The writer was requested to take the candle power of a very poor grade of gas. The jet photometer showed 8, which was obviously incorrect. The gas was so poor that passing 5 cubic feet per hour it would not light at a standard 8-foot Bray union tip. A lava tip was slotted out with a nail file until the jet burning 5 cubic feet per hour would light. A Thorpe gauge, tested before and after, was used to determine the rate of flow. For the standard an ordinary candle was used, which was allowed to burn until the flame was reasonably steady. Referring to the sketch, the Thorpe gauge



with the burner on was placed at *A*, the candle at *B*, and a screen made of a piece of white cardboard at *C*. The screen was set parallel to a line between *A* and *B*. A piece of straight wire, *D*, was moved slowly across the screen about ¼ inch in front of it, and the point where the two shadows *E* and *F* were alike was marked, and the distances *G* and *H*, from the point to the centers of the burner and candle, respectively, carefully measured. The strengths of the two lights were then proportional to the squares of the distances *G* and *H*. The height of the candle flame was measured and the flame blown out, the candle allowed to cool and wrapped up carefully without disturbing the wick. When the writer next had access to a standard bar the candle was tested, allowing it to burn until the flame equaled the measured height. Having determined the candle power of the candle, the candle power of the flame was readily calculated by multiplying the candle power of the candle by the square of the distance *G* and dividing by the square of the distance *H*. The method gives a fairly close approximation. In the particular case the candle power of the gas was less than 2, a further illustration of the unreliability of the jet photometer. This method should be used in constructing a home-made photometer by substituting a standard candle for the ordinary candle. The standard candle is not very accurate, but is certainly more dependable than the jet photometer. The Thorpe gauge should be checked frequently, or a 3-light dry meter, with the top off so that more accurate readings may be taken, may be substituted.—G. I. VINCENT, Des Moines, Ia.

No. 4.—*A House Piping Auger.*—One of the most useful and efficient tools for the house piper is the bit we have in use for installing riser pipes in partitions. It is a tool that should have a pl ce in every house piper's kit, as it is a great saver of time and labor, and also decreases the liability of accidents to ceilings and side walls of the house. In making up one of these tools, first buy a 1¼-inch nut auger, then take it to a blacksmith and have a ½-inch round iron shank about 8 inches long welded to bit shank and on this cut a ½-inch pipe thread and screw on a ½-inch by ¾-inch coupling. The bit is then ready for use. The nut auger is preferable, for the reason of its having no outside cutting lips, consequently will not be ruined in striking nails in plaster. In the installing of riser pipes we often find headers in partitions that are extremely hard to get at in the old way, but by having one of these bits, all that is necessary is to screw a piece of ¾-inch pipe on to bit (any length suitable to height of ceiling) and bore down through header, adding more pipe if needed, and when through into basement, unscrew bit and the riser is in place. This same bit can, and has been used, from cellar up toward the attic, and with the same success, and in our experience of a year or more with this tool we consider it indispensable.—J. C. FAIRWEATHER, St. Charles, Mo.

Discussion.

Mr. Haines—I move a vote of thanks be tendered Mr. Mitchell for the very able manner in which he has conducted the Wrinkle Department. I feel that, while the number of Wrinkles presented is small, it is an excellent beginning, and I trust that in the ensuing year Mr. Mitchell will have the hearty co-operation of the Association in presenting more Wrinkles.

The President—You have heard the motion, gentlemen. All in favor please say "Aye." Contrary, "No." Motion carried. Mr. Mitchell, you have the thanks of the Association. Gentlemen, these Wrinkles that have been submitted are open for discussion, if any of the members care to discuss them. With the reading of the Wrinkle Department report we have had all of the papers that were on the programme, except that of Mr. Reuping on "Experience in Operating Water Gas Machines." Mr. Reuping has been unable to prepare a paper on this subject, but inasmuch as he is cognizant of the water gas practice, I think it would be of interest to the members to have him detail his methods at Sioux City, and we will then discuss the subject of operation of water gas machines in general.

MR. REUPING'S CONTRIBUTION.

Mr. Reuping—When I was requested to present this paper before the Association, on account of my limited experience, I did not feel competent to properly treat a subject which I consider one of the most intricate branches of the gas industry, and as I have consequently not prepared any definite data, my few remarks will necessarily be more or less general. The particular part in the manufacture of water gas, concerning which we are still in the dark, is the proper heat to carry in the carburetter and superheater. It has been my experience that, when these shells appear to be in perfect condition, some unknown condition may suddenly arise, causing a material change in the results. Looking into the matter it is frequently rather a difficult problem to locate the exact cause, and before I was aware where the trouble was located conditions again returned to the normal. Within the last year or two, however, considerable advancement has been made, and I trust within a short time more reliable information will be furnished in regard to heats. In this connection I might mention electric pyrometers which have been successfully installed in a number of places. In addition, analyses made of gases, when subjected to different temperatures, will furnish data that will be of considerable interest. The blue glass pyrometer, which has been used principally heretofore, is, at its best, very inaccurate, and all figures obtained therefrom cannot be depended upon. Another difficulty we have is determining the proper amount of blast to carry, the present methods being very inaccurate. The development which has been made in apparatus designed for measuring the blast head, as for example, the Venturi meter, will undoubtedly throw additional light on generator fuel results. With these few opening remarks, I hope an interesting discussion may follow.

Discussion.

The President—Mr. Forest, will you tell us something of your experience with water gas machines.

Mr. Forest—I am only a novice in the gas business and located in a little country village which is generally considered too small to be even considered as a gas proposition. However, I will say that we, like a great many others in this western country, have met with what is known to some of you as gas promoters, who work on the plan of "first finding out how much you have got, and then getting it all." With the old crude oil process we found we had an elephant on our hands, and after operating a year and sinking a good deal of money in operating expenses, we decided to make a change. We originally had the crude oil or naphtha system as constructed by the Practical Gas

Construction Company, of North Chicago. Now we have a combined generator and carburetter all in one, known as the Tenny process. Before making the change I visited something like 25 different water gas plants, some low and some high pressure. Of course all gas men tell you the truth, so each one is making gas for a little bit less than the other fellow. Some used a certain amount of coke; others used coal. If I am to believe half told me, we are making gas at the present time, for the small output, in a very economical manner. I believe we are turning out gas that is quite as satisfactory as in many other places, and that is quite satisfactory to our patrons. We have the disadvantage that we do not have holder capacity sufficient; in fact, we have no holder. Our storage is simply by compression tanks, and we are delivering to our customers without governors at a pressure from the plant; that is, without individual governors. We have our reducing governors from the compression tanks to the main, to about 5 inches. We attribute to this cause the fact of a few of our customers thinking their bills excessive. However, upon the whole I think we are learning a little, and will eventually have a nice paying proposition.

Mr. Waring—Referring to this original paper and the author, I would like to say that Mr. Reuping's remarks I think were exceedingly fine, and also that his modesty, I think, is only excelled by his ability. He was my assistant, and at the time he had charge of the manufacturing end of the business we had never gotten better results in operating with water gas. He brought out the point of the electric pyrometer. We are using it in Omaha, having started only recently, and we hope to be able at some future date to give definite temperatures that would be desirable in checkerwork to gasify different oils that are on the market. We have also installed a Venturi meter, and while we don't know how many cubic feet of air we are putting under our fuel bed and into our carburetter, we do know relatively how much we are using, and by experience we will be able to determine just what amount of air to use. We will also install a steam meter, which we have not yet done. By means of the steam meter, Venturi meter and electric pyrometer we will be able to determine conditions of which heretofore we have been in the dark. The blue glass pyrometer can best be described by a question that I heard asked by some one who wanted to know what was the value of one glass in a blue glass pyrometer. The answer was it was worth half as much as two glasses. It is very unreliable for determining temperatures on checkerwork, especially when the checkerbrick are covered with foreign substances which will heat to an incandescent state on account of oxygen passing over and igniting the carbon which is in contact and thus deceiving one in the temperature of the brick. We have used in Omaha, which is probably one of the older plants in this district, tar as generator fuel for the past 10 years, until about the 1st of February, when it became so valuable that we could not use it in this way. We are getting from 3 to 10 cents per gallon for it and selling more than we can make. Tar in the generator at the present price of fuel is worth about 3 cents, so the minimum price we are getting is as much as the maximum price for generator fuel; but where a water gas set is operated and there is no market for fuel, it would be wise for the operator to investigate the use of tar in the generator as fuel. A gallon of tar is equivalent to about 10 pounds of gas coke or to 8 pounds of oven coke; according to Philadelphia's experience it is equivalent to something over 7 pounds of anthracite coal. In Omaha we have had no experience in the use of anthracite coal as a generative fuel on account of its prohibitive price. The question of the disposition of tar should possibly have come under that head, but it is just as well to mention it in connection with the operation of the water gas plant.

Mr. Vincent—A couple of little Wrinkles have developed in operating water gas machines in Des Moines that might be interesting. We found that the cast iron sleeves on our generator cleaning doors, which are usually cast intact with the frames, melted off. We were first provided by the manufacturers with cast iron blocks which were to fill with fireclay and place in these sleeves to fill them during the operation. We found that the cast iron blocks and sleeve, in fact, the whole business, melted and ran into the pit. Then we were advised to plaster them up with fireclay, making a brick and fireclay wall, which we did. Then the sleeve melted off, leaving the firebrick wall. Next we were advised to fill our fire with cinders, which we did, and killed our fire. So we concluded the best thing to do was to design an arrangement which, while it might melt off, could be easily replaced. We took out our frames, cut off the top and two sides of the sleeve, and made a pattern to just the same size as the top and two sides, making a long U-shaped piece set on top, above which was put a long, special tile conforming to the radius of the inside of the generator and extending over the edges of the box. When these cast iron, U-shaped pieces melt out it is a matter of a very few minutes to take them out and put others in. Another thing—it is not original with us, for I find lots of other people doing it. We are running two machines, and when one is idle we close off the generator by closing the switch valve, opening a valve in the top of the carburetter right into the air, and with the valve open it creates a natural draft through the machine, which we have never found sufficient to heat up the bricks to the melting point, and it keeps our carburetter very clean. We have been able to run our carburetter without cleaning for a much longer period than before we made that installation. In addition, about once in two weeks we empty the machine and blast through it from the generator valve, and that completes the burning off of the carbon. You can also, if you are not afraid to do it, open your carburetter, then close the generator valve and open it again with a little bit of fuel in the generator. That will make a slight explosive mixture which will loosen all of the carbon and blow it out. We have run the carburetter bricks as much as 119 24-four hour days.

Mr. Waring—Do I understand that you shut both the switch valves in oxidizing your carbon?

Mr. Vincent—Yes; in using the ordinary air draft, which is done whenever our machines are idle, we disconnect the interlocking valve, close off the generator completely and drop the top valve; the bottom valve is already closed. We also leave a crack in the generator door of about a ¼ of an inch.

The President—This will bring the paper list to a close.

Votes of Thanks.

Mr. Clabaugh—If it is in order, I move a rising vote of thanks to the Messrs. Averill for the magnificent manner in which we have been entertained by them during our stay in Cedar Rapids. [Seconded by Mr. Haines and carried by a rising vote.]

The President—I think we may say to the Messrs. Averill that they have a truly sincere expression of the feeling of this Association for their hospitality.

Mr. Vincent—I move a vote of thanks to Mr. Reuping for starting the last discussion, and include in that motion an expression of regret that he did not prepare the paper. [Seconded by Mr. Waring, and adopted.]

The President—Mr. Reuping has the thanks of the Association. Is there any further business to be considered?

Mr. Clabaugh—I wish to move our thanks to Miss Nash for her kindness in coming over here, and we know the able manner in which she has done her work. [Seconded.]

The President—I think I may say without putting the motion that it expresses the feeling of the Association and its thanks to Miss Nash and appreciation of her work.

Mr. Waring—Mr. President, I move that the thanks of the Association be given to our most efficient President for the manner in which he has conducted this meeting and the interest which has been taken. [Seconded.]

Vice-President Haines—All in favor please signify it by a rising vote. It is unanimously carried.

Mr. Clabaugh—Last, but not least by any means, I would offer a vote of thanks to our Secretary for the able manner in which he has done his work. [Seconded and carried.]

The President—The Secretary has the unanimous vote of thanks of the Association, which I am sure he deserves. Now, gentlemen, there being no further business, I wish to announce that the banquet will be held this evening at 8 o'clock in the main dining room of the hotel. Dinner will be served promptly. I also wish to request that any who have not procured their tickets for the banquet will see Mr. Averill immediately following adjournment, and if for any reason they should not be able to get to him in the rush, they will call at the office of the Gas Company within the next half hour to procure them. There being no further business, the meeting stands adjourned.

Junkers' Automatic Calorimeter.[1]

By Prof. Junkers, in *Journal für Gasbeleuchtung*.]

The favorable reception and extensive application which my calorimeter have met with in scientific and industrial circles have induced me to endeavor to make the instrument still more useful, particularly in two directions. On the one hand, I have tried to do away with the readings and the calculations of the heating values, however simple these calculations might be, and to cause the heating values to be indicated directly. On the other hand, the aim was to combine the apparatus with a recording contrivance, so that the heating values might be recorded automatically and continuously. Doing away with

1. Translation in *The Gas World*.

the readings and calculations increases the trustworthiness of the data obtained, since the errors which may creep in through faulty readings or calculations are eliminated. Further, since the heating values are ascertained, not by isolated tests, but in unbroken series, it is rendered possible to have valuable knowledge of the variations in the heating value, which enables an accurate control to be maintained.

The principle of the estimation of the heating value remains the same as before. The heat from a flame is communicated to a stream of water, and the heating value is computed from the quantity of water and its rise in temperature, divided by the quantity of gas used.

The step in advance, as compared with the former calorimeter, is that the ratio between the quantity of gas and the quantity of water is now kept constant, so that the rise in temperature itself affords directly a measure of the heating value, being proportional to the same. The maintenance of a constant ratio between the gas and the water is effected by coupling the gas and water supplies together. Simply to couple together an ordinary gas meter and a water meter would not do, since such apparata are adapted only for giving the measurement of gas or water which runs through in a pretty strong stream, without affording adequate control of the quantity which does flow through. In the present case what is wanted is not measurement but regulation, so as to keep up the uniformity of ratio between the two streams, while at the same time the quantity of gas or water passing may vary. Regulators with such a purpose as this in view had to be thought out; and this has involved thorough-going study and research In the instrument as now made, a gas meter is coupled with a water regulator; thereby the uniformity of ratio is maintained, for it is sufficient to have one of the two streams regulated. For the sake of greater accuracy, further regulating appliances are added which prevent disturbance of the results by variations of pressure in the water supply or in the quantity of water passing. Through keeping the water pressure constant, the water regulation is prevented from acting back on the gas meter, and this does not then lead to erroneous data.

The rise of temperature may be measured by different means. A thermopile arrangement has been found very convenient; the two junctions being bathed in the incoming and outgoing currents of water, respectively.

The whole apparatus is assembled in a case, as shown in Fig. 1.

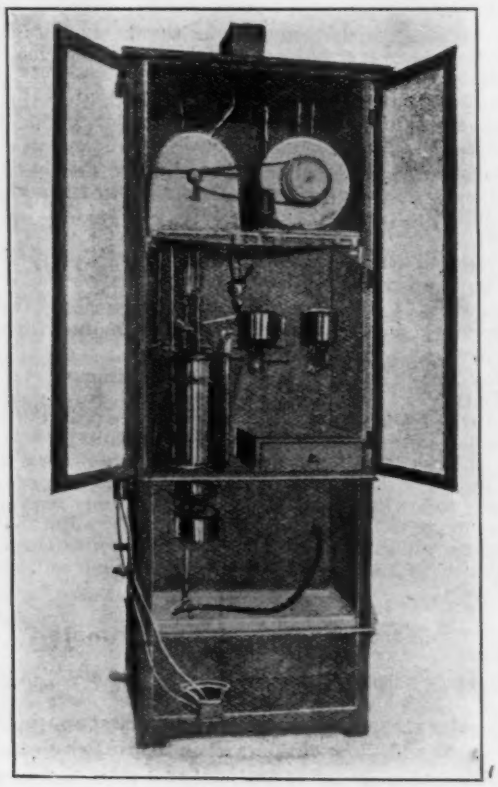


Fig. 1.

The calorimeter is seen to the left in the middle section and partly in the lower section. The thermo-element is seen connected with the calorimeter. The milli-volt meter, for measuring the electric voltage produced in the thermo-element, is in the drawer below, and can be taken out and put down at any convenient point. The scale of the milli-volt meter is very readable, with divisions of 1 millimeter (0.04 inch), and with a mirror to prevent errors of parallax through not looking straight at the needle and scale; and the heating values can be read off accordingly with great accuracy. At the back of the case, to the right in the middle section, are two gas pressure regulators, and to the left of these a water flow regulator. The float box for maintaining a uniform pressure of water is seen at the top of the case. The liquid in the gas meter can be controlled by an overflow of special construction. All parts are connected by rigid tubing. The connections with the gas and water supplies are effected by the three screw connections shown to the left of the case. The products of combustion go out through a chimney, which is protected against draughts.

Several instruments of this kind are already in use, and have shown their usefulness. The accompanying cuts, Figs. 2 and 3, are from

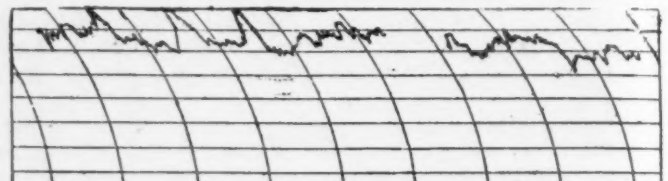


Fig. 2.

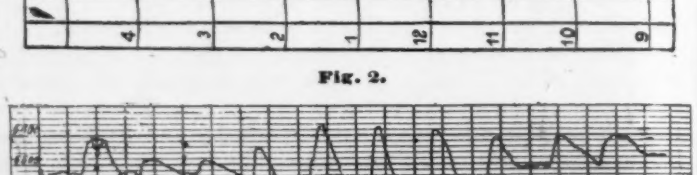


Fig. 3.

records taken by them. Fig. 2 shows the curve of heating values of Dessau producer gas, taken from about 9 A.M. to about 4 P.M.; the considerable variations in the heating value will be noted. The cause of these variations lies in the increased production of steam when the ashes fall, upon the raking of the fire bars; this increase of water vapor, passing through the hot layers of fuel, produces water gas, which raises the heating value of the producer gas considerably. Fig. 3 shows the heating values of Hanau gas from about 2 P.M. (left to right) to about noon of the next day. The values shown run from 4,700 to 5,900 calories per cubic meter (528 to 663 B.T.U. per cubic foot).

Wherever, then, it is of importance to be acquainted with the variations in the heating value of the gas produced, as in gas works, gas engine plant, coke ovens and blast furnaces, the automatic calorimeter may render valuable service in fulfilling the requirements necessary for a continuous control of the operations.

The Municipal Ownership Inquiry.

The work of the Municipal Ownership Commission of the National Civic Federation is beginning to show through the printing in the newspapers of extracts from the Commission's findings, which are almost ready for publication in full. Regarding the regulations existing between labor conditions and municipal ownership two reports have been written, respectively, by Prof. John R. Commons, University of Wisconsin, and Mr. J. W. Sullivan, the Editor of the "Clothing Trades Bulletin," which publication is a union mouthpiece. The main part of Prof. Commons' contention (he is an ardent advocate of municipal ownership) is as follows:

The natural tendency of municipal employees to better their own condition by use of their political strength is seen in the growth of the Municipal Employees' Association. This is a spurious form of trade unionism which has sprung up with the growth of municipalization, and nothing of its kind has been found among American unions. It has gained affiliation with other unions in the Trades Union Congress and in local trades councils. Its platform is simple enough—to prohibit strikes, to oppose councillors at the poles if they stand in the way of granting its demands, and to call on other unions for help in the elections. Its demands are in excess of anything that other unions have been able to secure from private employers or even from municipal corporations.

It invites into membership all employees of municipalities, and since they are nearly all eligible to other unions, evidently the aim of this

organization is to separate a privileged class of workmen, and to do this through the political power of those whom they abandon. It weakens other unions while building on their support. With even a minimum of intelligence in the other unions, such a parasitic union would be repudiated. Such has been the fate of the Municipal Employees' Association. As long as its membership was small the consequences of its policy were not observed and its demands received the uncritical assent of others in the general approval of all efforts to raise wages. But with its rapid growth during the last two years the unions of unskilled workmen, who suffered first from its competition for members, brought their protest to the Trades Union Congress in 1906, and that body, after careful deliberation, repudiated the Municipal Employees' Association and all similar organizations of public employees by the practically unanimous vote of 1,196,000 to 42,000.

It is thus promptly settled, before this organization has reached 15,000 members throughout Great Britain, that the trade union world is clearly opposed, both in sentiment and self-interest, to the creation of a privileged class of municipal employees. As far as the regular trade unions are concerned the principle of trade union wages rising and falling in municipal employment is accepted in its full significance. Without the support of the regular unions the strength of the Municipal Employees' Association has disappeared. It was a temporary phase of the rapid increase of municipal ownership.

The increase in municipal ownership in Great Britain has, of course, brought an increase in the number of municipal employees, and this has caused apprehension in certain quarters. Generally the chief officers of the municipal enterprise take the ground that they and other employees should not vote in municipal elections, and they openly set that example to their subordinates. Some of them go even so far as to advocate the disfranchisement of municipal employees in municipal elections. This has also been advocated by some of the councillors. However, such a proposition is no longer seriously considered. If the vote of municipal employees is a menace, the remedy must be looked for in directions other than disfranchisement. It goes without proof that such a remedy is needed, for municipal employees sooner or later cast their votes for candidates who promise or have secured a betterment of their condition, regardless of its effect on the enterprise as a whole. Omitting disfranchisement, there are two directions in which such a remedy can be found—first, a limit to be set beyond which municipalization shall not go, and, second, the attitude of the public, and especially of the workmen in private employment.

Mr. Sullivan, also, in support of his contention that municipal ownership has not bettered the condition of its employees, says: "Any advantages in wages or hours to be figured out for the municipal enterprises investigated in America over the private ones compared with them look like State illustrations of the soft berths to be found in public employment. To what extent the jobs are political for the employees, single or collectively, or a bid for the labor vote, is constantly a question. Public employees, frequently against their will, under duress from officials who may injure them, promote by election contributions the fortunes of certain men and parties, though at heart they may be opposed to both. The executive, mayor, councilman or department head, not only in appointing, but in promoting or dismissing employees, is exposed to partisan, social, personal or other pressure. Even if the reformer in office is genuine, even if the scheme he has promises well for the working masses, there arises the question of the duration of his official powers and those of his successors with similar aims, together with the assiduous attention of the public to its own protection."

Mr. Sullivan adds with regard to American conditions: "In America the municipalized enterprises visited by our labor investigators have been rich mines for significant facts relating to politics rather than to labor. These facts are not usually among those heretofore emphasized by the American advocates of municipal ownership. The testimony as to political rottenness, root and branch, in Syracuse, Allegheny and Wheeling, is conclusive. The municipal plants examined in these cities, it is to be remembered, were selected as models by representative municipalizers of the commission. Nor is the political labor situation in Detroit, Cleveland, Chicago or Richmond at all settled as well as it might be. In Cleveland the present mayor in the beginning increased his reform forces in the public water department so as to strengthen his vote in the primaries—an act possible at all times also under the next and succeeding administrations, which may be bad where the present is good. The degree of purity attained by the present administration is attributable to the officials and the public sentiment aroused and not to municipalization. In Chicago, where civil service is ironclad, the appointment by the mayor of department heads and even of the Civil Service Commission itself has more than once proved a vulnerable point in the civic armor, with sad results. In Detroit, Cleveland or Chicago the stability of the municipally operated enterprises rests largely on the mayor, who, however personally estimable and statesmanlike, necessarily becomes as a candidate a relatively good or bad politician, representing for a brief term a policy that may change with his successor. It is plain that in this political situation the resultant labor problem is most difficult. An employee can only hold office in uncertainty, with its consequent evils. This form of disquiet is not usual in private employment. As at Richmond, its exclusion of black men suggests a burning race question indeed, North and South, were municipalization generally adopted and Richmond's example in that respect followed.

"Any advantage in wages or hours to be figured out for the municipal enterprises investigated in America over the private ones compared with them looks much like State illustrations of the soft berths to be found in public employment. To what extent the jobs are political for the employees, singly or collectively, or a bid for a labor vote is constantly a question. A correct view takes in these points: Syracuse, the wages situation politically debauched; Wheeling, the same; Allegheny, the same, to an extent that when a difference of 50 to 100 per cent. in favor of municipalization is soberly computed by one man it makes another laugh; Detroit, private and municipal plants, but a shade difference: Cleveland, 9 hours municipal against 10 in the general labor market, wages the same; Chicago firemen in the fire department do not receive union rates; New Haven—no municipal undertaking—hours, 8, public departments, as against 9, water works; Philadelphia, United Gas Improvement Company, better wages and hours than any city department and a reduction from 12-hour shifts under municipal operation to 8 under the Company, with higher wages."

Insulation.

Mr. E. J. Williams, in a paper read before the Newcastle (England) Institute of Electrical Engineers, said: It is really surprising how little explored is this enormously important field of research. What information we have on the subject is contained in the proceedings of the various learned societies, and the jealously-guarded private information of the manufacturer. That part of the subject dealing with the insulation of machines has recently been very clearly dealt with by Turner and Hobart. The majority of electrical engineers look upon the subject of insulation as of quite minor importance. He knows what the insulation resistance will be, and the voltage that would break it down, but what these would be after the job has been running some time he does not know, because the busy manufacturer has not time to go into that sort of thing; nevertheless, it is of vital importance to the advancement of the industry.

In examining the scientific basis on which effective insulation depends, it is considerable help towards a definite conception of the electric field to assume a simple dielectric made up of positive and negative cells in chains, and on applying oppositely charged electrodes to the end of a section of the dielectric, the positive cells are drawn one way and the negative cells the opposite way—*i.e.*, to the positive electrode—and when there is electric displacement—*i.e.*, the positives and negatives slip all past each other.

The total mechanical force acting upon the whole substance within any element of volume is zero—*i.e*, supposing the dielectric to be a gas, a little metal ball hung by a silk thread in it would be neither charged nor moved. Hence the "action at a distance theory." Also, it is clear that the dielectric experiences a tension parallel to the intensity, and a pressure in all directions perpendicular to the intensity. In all ordinary substances (which may be considered as mixtures of ether and matter) the electric displacement is greater than in free ether for a given intensity. In perfect insulators, according to our conception, the cells cannot slip over one another. In this case electric displacement only can accompany any electric intensity. In imperfect insulators the cells slip slowly, and in conductors they slip rapidly. Taking this point of view, that every atom of matter is made up of small charge particles called electrons, and that no charges exist except the charges on electrons, it is possible to offer an explanation of thermo-electric and piezo-electric phenomena and the various other phenomena such as ohmic heating and electrolysis when there is (1) mechanical tension and compression (positive and negative electrons move in the same direction); (2) temperature disturbances (positive and negative electrons move in the same direction); (3) electric polarization or electrolysis, or simply conduction (the positives and negatives move in opposite directions). And a good insu-

lator has to stand all three in one form or another. It must also be able to exclude moisture, not take up much room, withstand acids, last a long time, be incombustible, flexible and easily worked and cheap. Generally insulation consists of a mixture of things, such as pure rubber, vulcanized rubber, impregnated cotton or paper, and varnish, and oil and air; and this is probably the most important cause of insulation troubles, because a different amount of polarization or electric displacement through these different dielectrics is obtained. The displacement being greater in dense bodies than in lighter bodies, being least in vacuo, the effect of this is to cause an unequal distribution of pressure over the insulation. As to the influence of the temperature of the insulation on its dielectric strength, when the temerature goes up, the dielectric strength goes down. Now, the temperature of an electric light station is not infrequently 100° F., and with the 70° F. rise of temperature usually specified, this brings the working temperature of the insulation up to 170° F., and if one happens to have been running on a 20 per cent. or 30 per cent. overload for a couple of hours or so, it will be quite possible to break down the insulation unless one has had pressure tests made at high temperatures, because the breakdown pressure will have probably dropped to something under three-fourths of what it would be at the ordinary temperature of the air, probably less than that if it has been on some time, owing to the effect that repeated heating, cooling and stressing has had upon it.

Data concerning the ageing of insulating varnishes published by the manufacturers of dielectrol, show that although the initial insulation of their product may be low, yet after eight or nine months of constant use it is as good as new, while the other varnishes have deteriorated enormously. It is a pity that there is not more information of this obtainable, but, unfortunately, such tests are difficult and expensive. The deterioration of varnishes, etc., is largely due to mechanical vibration, which powders them up, but the more flexible insulators deteriorate by charring. Unfortunately most of the insulators are also bad conductors of heat, so that if heat is generated inside, as in the conducting wire or in the body of the insulation, it is not at once radiated and conducted away. In consequence of this, various impregnating materials have been put upon the market, which, while scarcely, if at all, inferior in insulating properties, are of such composition as to facilitate the escape of heat from the interior of the coils. This is the more necessary as there is an energy loss which shows itself in the form of heat in the material itself, due to conduction through the ohmic resistance of the dielectric, the energy consumed in the way being, of course, proportional to the square of the voltage. This becomes considerable in high-voltage machines. The greater the heating and the more the stuff chars the greater becomes the conduction current, and if the rate of generation of heat exceeds the rate of cooling, the temperature will rise until the insulation breaks down.

Another Handsome Office Building.

The illustration herewith shows the handsome office building which is the business home of the Los Angeles Gas and Electric Company. It is one of the most attractive, best constructed and well adapted to its purpose in beautiful Los Angeles. For the photograph we are indebted to the attention of Mr. W. T. Owens, of 13 Park Row, New York city, who "snapped" it himself while recently in Los Angeles.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

MR. HOWARD W. SEXTON, General Manager of the Anniston (Ala.) Electric and Gas Company, died suddenly at his home in Anniston, the night of the 11th inst. Only a week prior he was elected Vice-President of the Alabama Commercial and Industrial Association.

THE Practical Gas Construction Company, of Chicago, is asking a franchise for the right to operate a gas plant in Hudson, Wis. The Company agrees to sell gas at a price not to exceed $1.25, and guarantees to have the works completed within 12 months from the signing of the agreement.

EARLY in the month, Mr. T. N. Case, of the engineering staff of the Kerr Murray Manufacturing Company, gave a clever address on "The Making of Gas," before the Men's Club of Plymouth Congregational Church, Fort Wayne, Ind. The lecturer used a small model gas plant in illustrating his narrative, which was listened to with attention throughout. The Club's quartet rendered a musical overture and a rythmic dismissal to the lecturer.

THE people of Boone, Ia., are still talking over the banquet that was given there the evening of the 10th inst., to 100 or more invited guests in the dining room of the Northwestern Hotel. The guests were received by Mr. Frank Maple, Manager of the Company, and the toastmaster was Mr. S. G. Goldthwaite. The feast was all that it should be and the speechmaking was to the point. The principal speakers were Mr. Farrow, of Boone; Col. E. G. Pratt, President of the Company; Judge Stevens, Col. Canfield, and Messrs. C. Brown, George D. Roper, Howard Loving and Charles C. Deering. The sprightly elocutionist, Mr. L. Leighton, contributed much to the festivities in rendering some up-to-date monologues. Those who attended the banquet and its sequel are ready to bear testimony to the headliner, "Isn't it Funny What Differences a Few Hours Make!" The banquet was in reality a sequel to the annual meeting of the Company, at which session the following officers were chosen: President, E. G. Pratt; Vice-President, George D. Roper, Rockford, Ills.; Secretary and Treasurer, E. C. Brown, N. Y. The annual reports were positive in their testimony to the rapidly increasing business of the Company.

THE United States Court of Appeals has rendered a decision in the cases entitled M. Kirchberger & Co. vs. The American Lava Company, in which contention the latter was sustained at all points. The contention in the main was that the alleged air envelope patent, issued August 31st, 1897, to E. J. Dolan, was a basic one, without the assistance of which no acetylene burner could be made practically operative. The Court dismissed the suits and flatly declared that the Dolan patent was void.

THE Gas and Electric Development Company reports the sale of the Kinsley (Kas.) Light and Power Company to Mr. A. D. Coleman, of Albuquerque, N. M. Mr. Coleman proposes to make important additions to the plant.

THE Gas Machinery Company, of Cleveland, O., has been awarded the contract for one of its double superheater sets of water gas apparatus by the Springfield (Mo.) Gas and Electric Company. Mr. W. A. Bixby, General Manager at Springfield, is in need of additional machinery with which to take care of the increased sendout secured since he assumed charge of the Springfield properties.

THE shareholders of the New Haven (Conn.) Gas Light Company at a special meeting held the 12th inst., formally accepted the act of the Legislature permitting the Company to extend its mains to and supply gas in the outlying districts of Milford, Branford and Guilford.

MR. FRED. MCCULLOCH, son of the President of the Hamilton (O.) National Bank, and who has a prominent interest in the Western Gas Construction Company, of Fort Wayne, Ind., will enter the shops of the latter next August. He graduated last Year Day from the Scientific Department of Yale College with honors, and he is to be congratulated over the pluck that determines him to go into the field of his future work right from the very fence posts. Good luck to him.

EARLY this month the Canon City (Cal.) Gas Company was taken out of the hands of the Receiver and a reorganization of the concern was accomplished. There will be no change in the active management. The Receiver has been in charge since the spring of 1904.

AT the annual meeting of the South Hadley (Mass.) Gas Company the officers elected were: President, Edward P. West; Secretary and Treasurer, Dr. F. H. Smith. These and Messrs. A. J. Randall, D. W. Prouty and Clifford Johnson comprise the Board of Directors.

"L. V. B." is informed the latest dividend of the Oklahoma Gas and Electric Company (1½ per cent.) was payable July 12th last.

THE franchise which Mr. John Carr and associates ask from the City Council of Coeur D'Alene, Idaho, provides that work under it must begin within the next 12 months, and the gas plant be completed, including not less than 5 miles of mains, within 2 years. The pipes are to run through the alleys. The Company agrees to supply the gas to public buildings at $1.25 per 1,000 cubic feet and $1.75 to the citizens. It must be extended into any part of the city where the citizens can assure the Company 6 per cent on the cost of extension. The city retains the power of regulating the charge for gas through the appointment of a Commission. The franchise is to continue in force for 40 years, the city reserving the right to purchase the plant after 15 years, its value to be ascertained through appraisement.

THE sum of $250,000 will, it is estimated, be necessary to complete the reconstruction of the municipal gas plant at Wheeling, W. Va., under the proposed plans. It will undoubtedly prove a profitable investment.

MR. WILLIAM W. ALCORN, once a member of the Philadelphia Gas Trust, died at his home in Philadelphia the evening of the 6th inst. He was born in Brooklyn, N. Y., December 6, 1844, and became a resident of that city in 1854. He was elected a member of the Gas Trust in 1883, serving as such for 4 years. He was at one time quite prominent in political circles, and in 1885 he was a candidate for the place of City Treasurer, but was defeated by Mr. Frank F. Bell.

MR. J. C. ROSS, Manager of the Utah Gas and Coke Company, will endeavor to show the residents of Salt Lake City that coke from a gas works is an excellent domestic fuel. There is little doubt that he will be successful.

A CORRESPONDENT in Kansas City, Mo., writing under date of the 11th inst., incloses the following: "A certified check for $8,043.03, payable to the Treasurer of the city, was tendered the city yesterday by the Kansas City, Missouri, Gas Company, as representing 2 per cent. on the gross receipts of the Company for 6 months ended June 30th. The total receipts are given at $402,151.48, and the falling off is explained to be due to the introduction of natural gas under the franchise held by Messrs. McGowan, Morgan and Small. The grantees are using the mains of the Kansas City, Missouri, Gas Company, and the amount of money received for the 6 months ending June 30 represents only what was taken in for artificial gas. McGowan, Morgan and Small have not as yet sent in an accounting for the 6 months they used the mains of the old Company for transporting natural gas. They, too, pay 2 per cent. of their gross receipts into the city treasury. For the same period last year the city's share of the Gas Company's receipts amounted to $11,605.46. At that time no natural gas was being used."

THE Stamford (Tex.) Gas and Electric Company has been incorporated. It is capitalized in $20,000.

THE firm of Childs, Hulswit & Co., have listed the securities on their Chattanooga (Tenn.) gas property on the Cincinnati Stock Exchange.

MR. CHARLES H. MCCORMACK has been appointed Deputy Commissioner of the Borough of Richmond (New York city) Supply of Water, Gas and Electricity. He succeeds Mr. Edward I. Miller, whose resignation was asked by the Commissioner in Chief, Mr. John H. O'Brien.

MR. MAX GEILE has been appointed assistant to Mr. Ellsworth Francisco as inspector of gas and gas meters for Newark, N. J.

"R. S. M." writing from Malden, Mass., under date of the 15th inst., says: "I failed to read anything in the JOURNAL describing the first Field Day of the officials of the Springfield Gas Light Company, the Malden and Melrose Gas Light Company, the Haverhill and Suburban Gas and Electric Companies, and the Concord (N. H.) Electric Company, which day is bound to become an annual feature, for it was a thoroughly enjoyable outing. The outing was successfully brought off the last week in June, and the scene of the festivities was Suntaug Lake Inn, and the beautiful grounds surrounding it, in Lynnfield, Mass. A special car carrying the party left Malden Square at midday bearing the Malden Companies. A ball game between the gas and electric divisions was a feature of the contests, and it was won by the light of the future men, who batted out 10 runs to 8 by the gas men. There were also contests in running, jumping (high and broad), a 3-legged race and a potato-sack sprint. Medals were awarded to the winners of each contest. Supper was served at 6 P.M., after which a business meeting was held, on the adjournment whereof a special car conveyed the participants home."

AT the annual meeting of the shareholders of the Consolidated Gas, Electric Light and Power Company, of Baltimore, Md., a goodly number of stockholders were present. The reports presented showed that there had been a substantial growth in both the gas and electric divisions of the Company's trading. The gross results for the working for the twelvemonth was thus summed up: Net income above operating charges, $1,711,000; fixed charges, $1,081,000; net earnings, $630,000. Considerable interest was shown over the statistics handed in respecting the means taken to provide for and take care of the growth of the business. In the gas division 18.9 miles of new mains were laid, and 6,335 new services were put down. The Westport electric power plant, which was put in commission about a year ago, is now carrying 80 per cent. of the total load of the entire electric division and in the current year an addition up to housing 2,000-horse power will be erected. Attention was called to an important contract recently closed with the McCall Ferry Power Company, under which a large supply of current will be secured from the Susquehanna river electric development. Extension of sub-stations and large additions to underground feeders, overhead lines and transformers were also installed and it was declared that the physical condition of the property is excellent. Reference was made to the easement tax, and it was stated that the taxes paid by the Company per 1,000 cubic feet of gas are as great or greater than the taxes paid in any other large city, and confidence was expressed that the Company will receive fair and reasonable treatment from the city of Baltimore. The stockholders elected the following directors: Messrs. Charles Adler, Alexander Brown, Anthony N. Brady, S. R. Bertron, Charles T. Crane, John B. Dennis, Charles H. Dickey, Francis H. Hambleton, Thomas J. Hayward, Fairfax S. Landstreet, Ferdinand C. Latrobe, Allen S. Miller, S. Davies Warfield, Frederick W. Wood, Thomas J. Shryock and Charles M. Cohn. Mr. Shryock is a new member of the Board. There were represented at the meeting by proxy and in person 106,426 shares. Mr. Thomas J. Hayward acted as Chairman of the meeting, and Messrs. H. A. Orrick and Owen Daly acted as tellers. Mr. Edgar H. Gans was judge of election.

WILLIAM WERB is no longer connected with the Key City Gas Company, of Dubuque, Ia., and other Companies are requested to note that his discharge was for cause.

ACCORDING to the report of the official gas inspector for Milwaukee, Mr. R. E. W. Sommers, the candle power of the gas supplied by the Company averaged 17.53. The average was the result of 39 separate examinations.

THE indications are that the Crescent City Gas Company, which has been supplying natural gas in Hartford City, Ind., for several years, will go out of business on or about September 1st. No gas.

UNDER the plan drawn up by the Improved Equipment Company, of New York city, the betterments agreed upon for the complete equipment of the works at Spokane, Wash., will entail an expenditure of $150,000. Mr. Earl H. Gimper, by-the-way, does not hold a very exalted opinion respecting the gas making value of Roslyn coal.

THE Sacramento (Cal.) Electric, Gas and Railway Company has applied for and will receive franchise rights to extend its mains into and through Highland Park, Curtis Oaks and the territory contiguous thereto.

THE Hartford City (Conn.) Gas Light Company has been authorized to increase its capital stock to $2,000,000.

AT the annual meeting of the Milford (Mass.) Gas Light Company no change was made in the management of the Company.

THE Hartford (Conn.) Company has about completed the pipe line intended for the gas supply of Thompsonville and Windsor.

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A. M. CALLENDER & CO.,
PROPRIETORS.

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NEW ENGLAND ASSOCIATION OF GAS ENGINEERS.

NOTIFICATION RESPECTING ADVERTISING.

Orders for new advertising, or for changes in standing advertisements, to insure attention in the issue following their reception, must be in hand any time of Wednesday.

AGENTS:

New York—American News Co., 39 and 41 Chambers St.
Germany—Lemcke & Buechner, of New York.
England—Aug. Siegle, 30 Lime Street, London.

MONDAY, JULY 22, 1907.

The Market for Gas Securities.

There was no marked change in the market for city gas shares in the week, yet whatever difference occurs in the quotation column is on the increase. It is surely a fact that Consolidated Gas should be at least 25 points higher than it is, but facts are facts, and the certainty is that it opened to-day (Friday) at 117 to 120.

Brooklyn Union is 106 to 112, but there is no inquiry for it. It is cheap, however. Washington (D. C.) is again above the 400 mark, which likely causes Mr. John J. Gribbel much basis for pleasure. The partner of that prince of gas men, Mr. John McIlhenny, was wise when he said it was not wise that all good things should go to Cincinnati. Peoples, of Chicago, is slowly gaining ground, and Massachusetts Common also feels the impulse of confidence.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

JULY 22.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$73,177,000	100	117	120
Central Union Gas Co.—				
1st 5's, due 1972, J. & J.	3,000,000	1,000	101	104
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	..	105
Mutual	3,500,000	100	190	225
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	98	100
New York & Richmond Gas Co. (Staten Island)	1,500,000	100	37	43
1st Mtg. Gold Bds. 5 p.ct.	1,000,000	..	98	104
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	101	103
New York and East River—				
1st 5's, due 1944, J. & J.	3,500,000	1,000	108	111
Con. 5's, due 1945, J. & J.	1,500,000	..	104	110
Standard	5,000,000	100	140	160
Preferred	5,000,000	100	155	175
1st Mtg. 5's, due 1930, M. & N	1,500,000	1,000	104	108
The Brooklyn Union	15,000,000	1,000	106	112
1st Con. 5's, due 1948, M. & N	15,000,000		107	..
Yonkers	299,650	500	130	..
Out-of-Town Companies.				
Bay State	50,000,000	50	¼	⅜
" Income Bonds	2,000,000	1,000	..	75
Binghamton Gas Works	450,000	100	..	65
" 1st Mtg. 5's	500,000	1,000	95	100
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	9	10
" " Bonds, 5's	5,250,000	1,000	75	80
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000	..	..
Chicago Gas Co. Guaranteed Gold Bonds	7,650,000	1,000	104	106¾
Cincinnati Gas and Electric Co.	29,500,000	100	97½	98
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	90	..
Columbus (O.) Gas Lt. & Heating Co	1,682,750	100	87	88
Preferred	3,026,500	100	107½	108
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	11,000,000	100	..	90
Mortgage, 6's	3,500,000	..	..	118
Chesapeake, 1st 6's	1,000,000	..	..	..
Equitable, 1st 6's	910,000	..	..	..
Consolidated, 1st 5's	1,490 000	..	..	112
Consolidated Gas Co. of N. J.	1,000,000	100	15	17
Con. Mtg. 5's	880,000	1,000	92	95
Bonds	75,000	..	..	100
Detroit City Gas Co	5,000,000	50	..	50
" Prior Lien 5's	4,618,000	1,000	..	98
Detroit Gas Co., 5's	381,000	1,000	75	80
" Inc. 5's	16,000	100	98½	100
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Essex and Hudson Gas Co.	6,500,000	..	39	40
Fort Wayne	2,000,000	..	..	..
" Bonds	2,000,000	..	55	..
Grand Rapids Gas Lt. Co. 1st Mtg. 5's	1,225,000	1,000	104½	105
Hartford	750,000	25	199	200
Hudson County Gas Co., of New Jersey	10,500,000	..	110	112
Bonds, 5's	10,500,000	..	107½	108½
Indianapolis	2,000,000	..	60	70
" Bonds, 5's	2,650,000	..	104½	105
Jackson Gas Co	250,000	50	82	..
" 1st Mtg. 5's	290,000	1,000	97	100
Kansas City Gas Light Co., of Missouri	5,000,000	100	..	36
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede, St. Louis	10,000,000	100	..	05
Preferred	2,500,000	100	95	110
Bonds	10,000,000	1,000	104	104¼
Lafayette Gas Co., Ind.	1,000,000	100	..	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	143	145
Madison Gas & Elec. Co.				
" 1st Mtg. 6's	350,000	1,000	105	105¾
" 6 per cent. scrip, due 1910	100,000	25	16	53
Massachusetts Gas Companies of Boston	25,000,000	100	57½	58
Preferred	25,000,000	100	83½	84
Montreal, Canada	2,000,000	100	218	218¾
Nashville Gas Lt. Co.	1,000,000	100	110	..
Newark, N. J., Con. Gas Co.	6,000,000	..	56	58
Bonds, 6's	6,000,000	..	137	138
New Haven	2,000,000	25	200	..
Peoples G. L. & Coke Co., of Chicago	25,000,000	100	91½	92½
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	20,100,000	1,000	..	..
" 2d "	2,500,000	1,000	104	..
Rochester Gas & Elec. Co.	2,150,000	50	88	..
Preferred	2,150,000	50	118	..
Consolidated 5's	2,000,000	..	104½	105½
San Francisco, Cal.	15,800,000	100	..	..
St. Joseph Gas Co. 1st Mtg. 5's	751,000	1,000	92	..
St. Paul Gas Light Co	1,500,000	100	45	47
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Syracuse, N. Y.	1,975,000	100	50	55
Bonds	2,047 000	1,000	102	..
Washington, D. C	2,500,000	20	400	405
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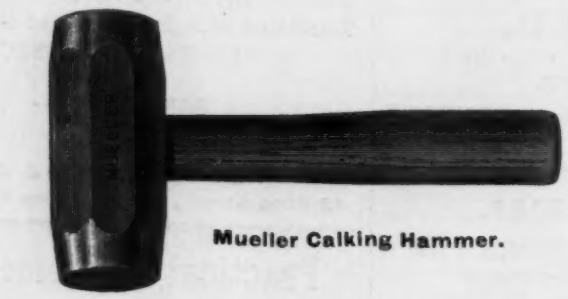

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SEWER PIPE AND FITTINGS,
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GLASS HOUSE REFRACTORIES,
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GRATE SETTINGS,
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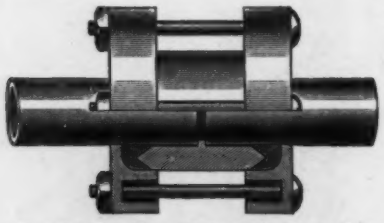
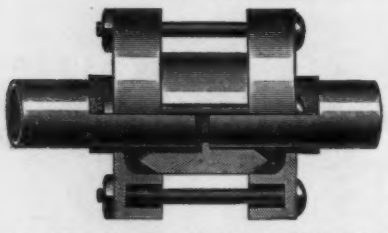
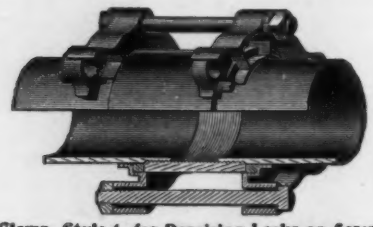


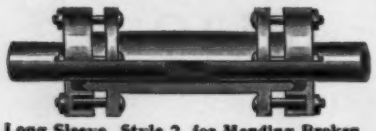
Regular Coupling, Style 1, for Plain End Wrought Iron Pipe.



Insulating Coupling, Style 5, for Plain End Wrought Iron Pipe.



Clamp, Style 4, for Repairing Leaks on Screw Collar.



Long Sleeve, Style 2, for Mending Broken Lines.

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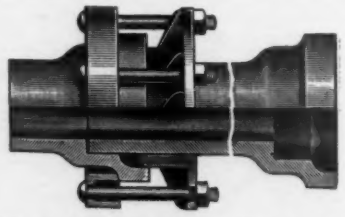
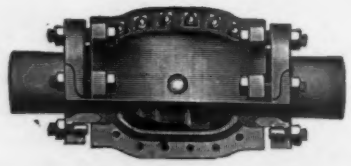
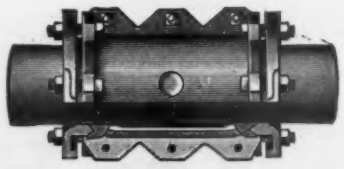


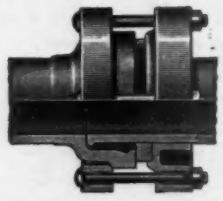
Coupling, Style 9, for Special Style Cast Iron Pipe.



Split Sleeve for Repairing Broken Bell on Cast Iron Pipe.

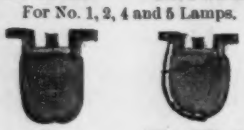


Split Sleeve for Repairing Broken or Cracked Cast Iron Pipe.



Clamp, Style 4½, for Repairing Leaky Lead or Cement Joints in Cast Iron Pipe.

No. 1 Plain — No. 1 Wired.
For No. 1, 2, 4 and 5 Lamps.



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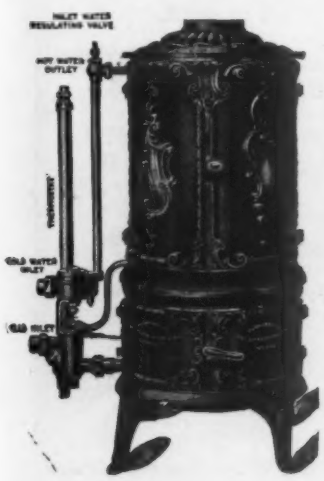

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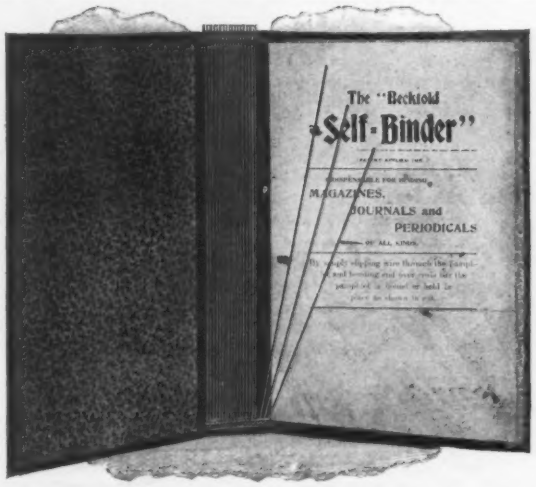

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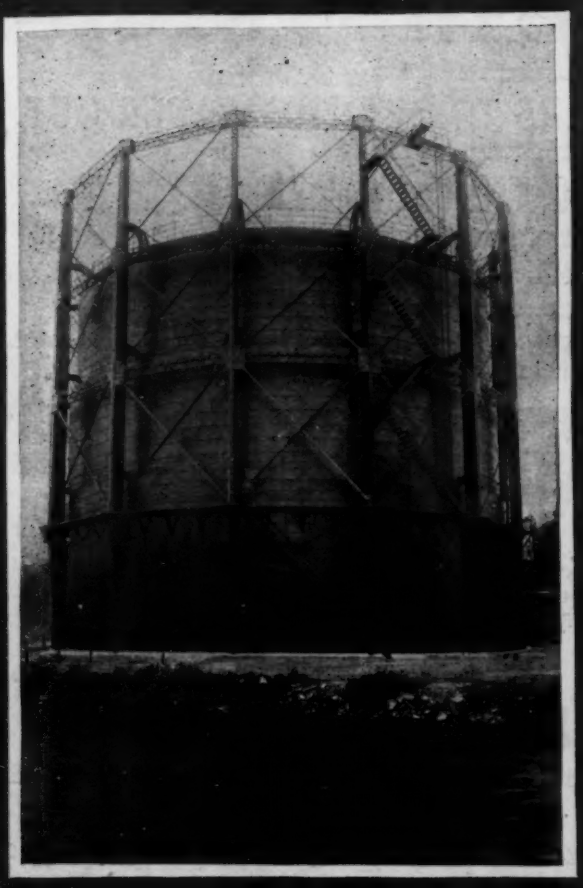

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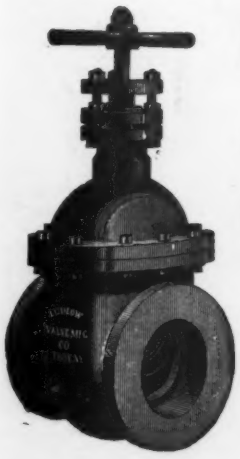

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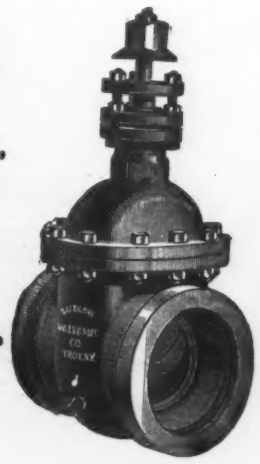
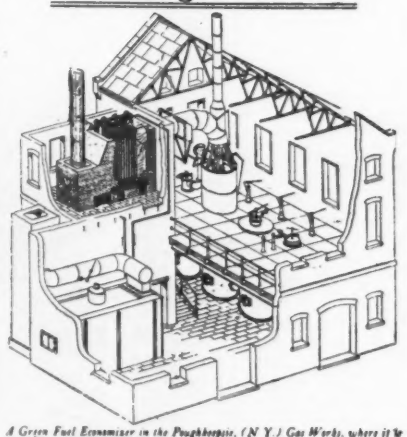


How to Save 15% of the Coal in Making Water Gas



A Green Fuel Economizer in the Poughkeepsie, (N. Y.) Gas Works, where it is Saving 25% of the Boiler Fuel. The Green Air Heater is Installed in the Same Manner as the Economizer and will save 15 % of the Generator Coal.

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SEND FOR THIS PAMPHLET.

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The stack valve gases from a gas generator usually escape at from 1,500° to 1,800° F. After passing them through the Green Air Heater to heat the blast they will still have a temperature of 800° F., which is higher than the usual temperature of flue gases from boilers. They may, therefore, still be used to heat water for the boiler, and will thus save 20 per cent. of the boiler coal. On this basis, a plant making 5,000,000 cubic feet of gas per month will save nearly $2,500 per year on a total investment of $3,500.

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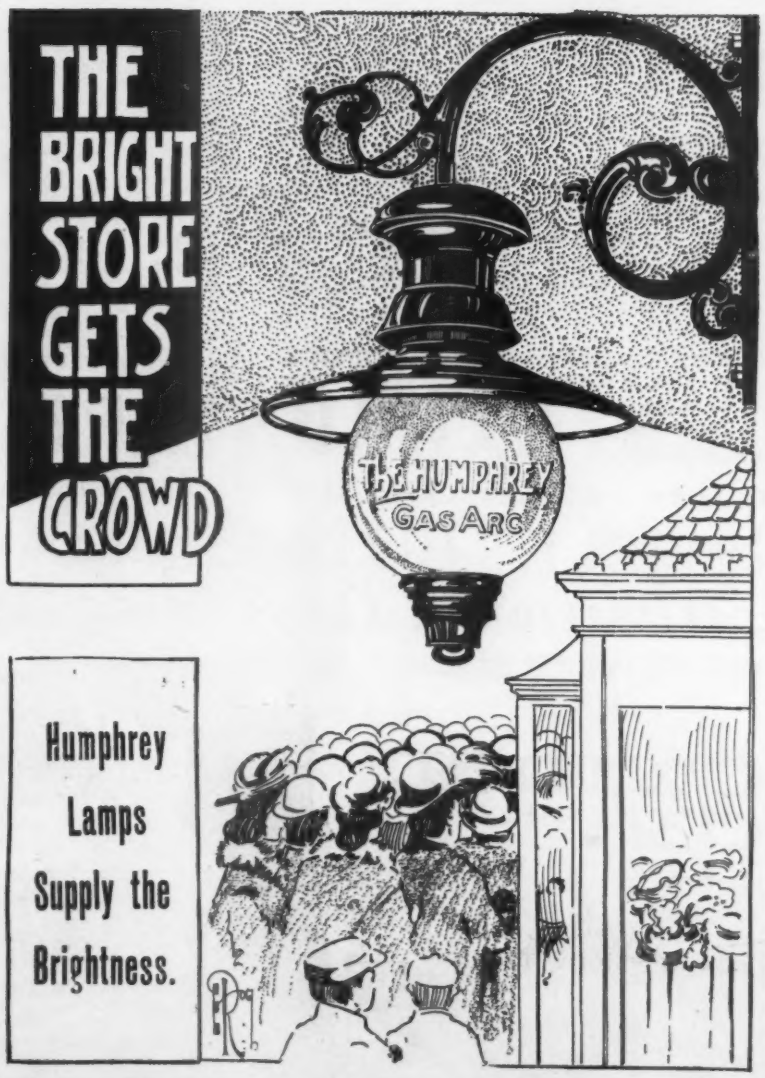

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THE ANSWER IS IN THREE WORDS:
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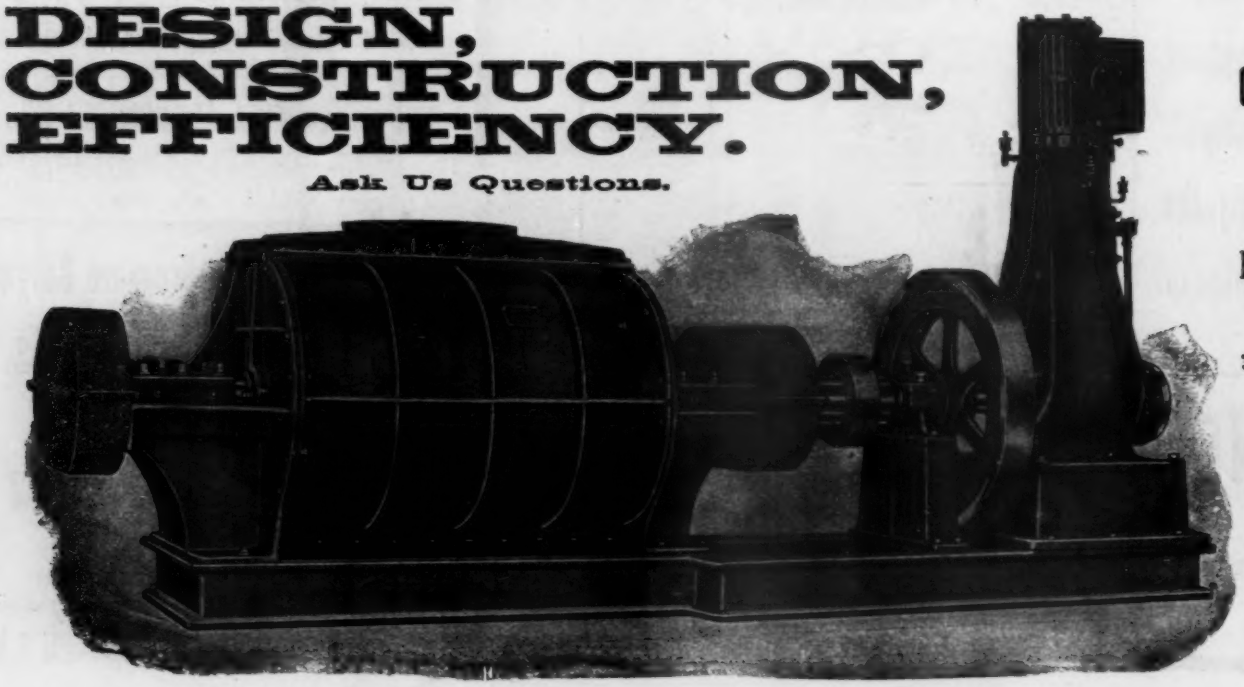
Ask Us Questions.



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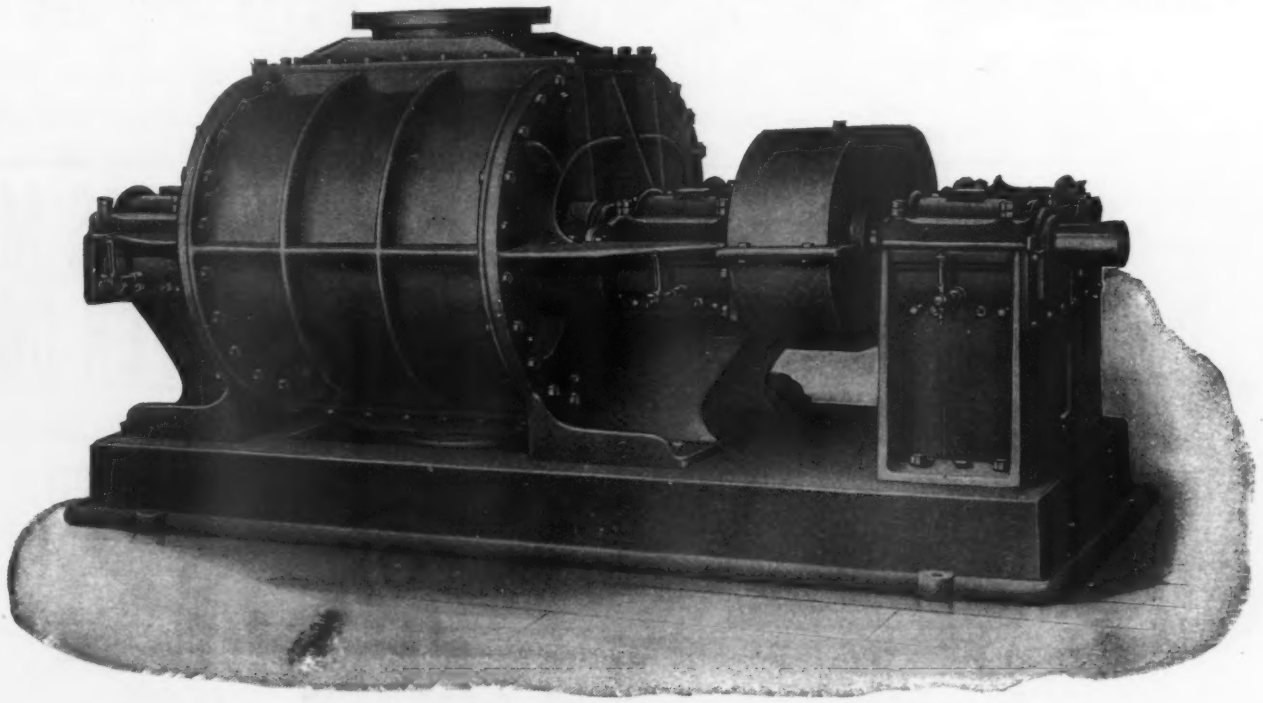

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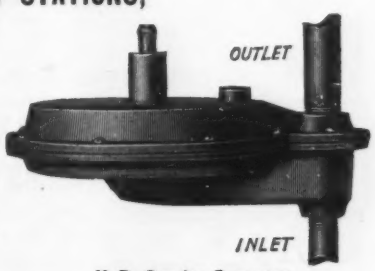

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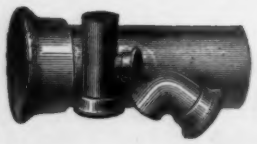

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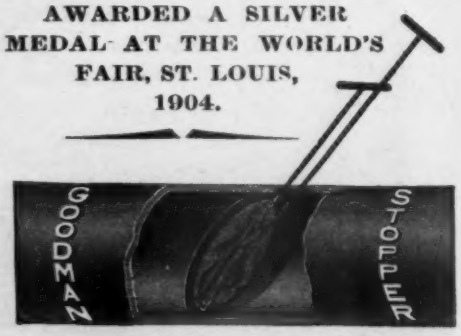

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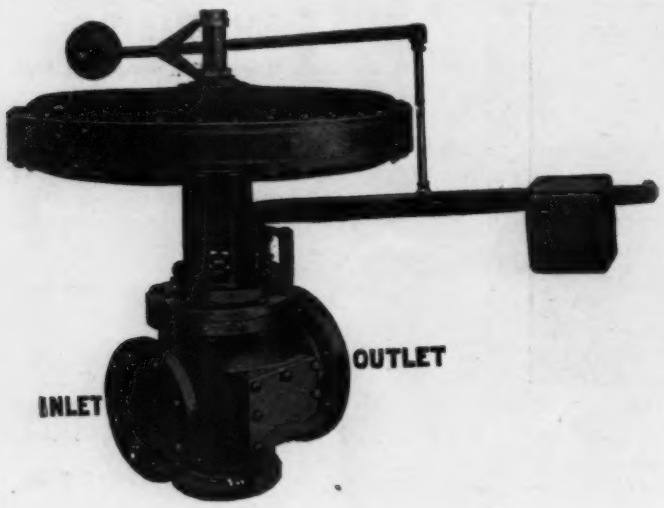

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Photometrical and Experimental Apparatus.

PUBLIC LIGHTING TABLE.

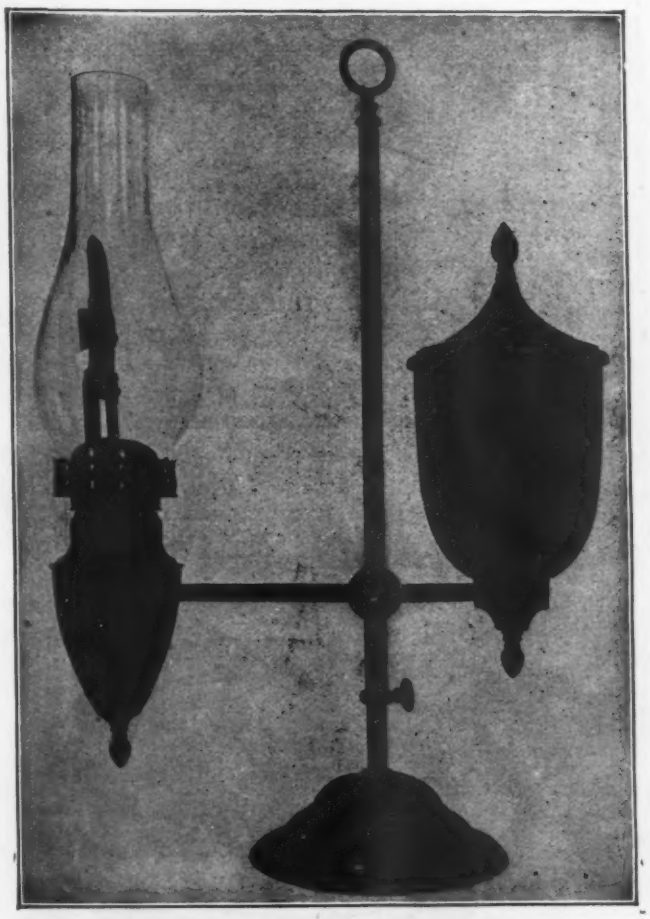
AUGUST, 1907.

Day of Week.	Date.	Table No. 1. FOLLOWING THE MOON. Light.	Extinguish.
Thu.	1	7.50 PM	12.50 AM
Fri.	2	7.50	1.30
Sat.	3	7.50	2.00
Sun.	4	7.40	2.40
Mon.	5	7.40	4.00
Tue.	6	7.40	4.00
Wed.	7	7.40	4.00
Thu.	8	7.40 NM	4.00
Fri.	9	7.40	4.00
Sat.	10	7.40	4.00
Sun.	11	7.30	4.10
Mon.	12	7.30	4.10
Tue.	13	8.40	4.10
Wed.	14	9.00	4.10
Thu.	15	9.40	4.10
Fri.	16	10.10 FQ	4.10
Sat.	17	10.50	4.10
Sun.	18	11.40	4.20
Mon.	19	12.40 AM	4.20
Tue.	20	1.40	4.20
Wed.	21	2.50	4.20
Thu.	22	No L.	No L.
Fri.	23	No L. FM	No L.
Sat.	24	No L.	No L.
Sun.	25	7.10 PM	9.20 PM
Mon.	26	7.10	9.50
Tue.	27	7.10	10.20
Wed.	28	7.10	10.50
Thu.	29	7.10	11.30
Fri.	30	7.10 LQ	12.00
Sat.	31	7.10	12.40 AM

TOTAL HOURS DURING 1907.

By Table No. 1.

	Hrs.Min.
January	211.10
February	193.40
March	182.10
April	167.00
May	157.00
June	145.30
July	151.50
August	162.30
September	175.30
October	202.40
November	209.30
December	231.50
Total, yr.	2190.20



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10-Candle Power.

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This lamp is a perfect substitute for the 10-candle Pentane Lamp hitherto used, and has the following advantages:

1st. It uses Standard Kerosene Oil (Pratt's Astral Oil or equivalent).

2d. It is remarkably steady. Will burn 24 hours continuously with less than 2 per cent. variation.

3d. It is much less dangerous than Pentane, which is a kind of gasolene.

4th. It is not easily affected by air currents in the photometer room.

5th. Since the lamp may burn continuously, the candle power of gas may be taken at any moment, if necessary. This insures steady illuminating power without waste of carburetting material.

6th. The first cost of the lamp brings it within the reach of even small gas works.

7th. Costs much less to maintain than a Pentane lamp or sperm candles doing the same service.

8th. Is not affected by the weather.

PUBLIC LIGHTING TABLE.

AUGUST, 1907.

Day of Week.	Date.	Table No. 2. NEW YORK CITY. All Night Lighting. Light.	Extinguish.
		P. M.	A.M.
Thu.	1	7.10	3.30
Fri.	2	7.10	3.30
Sat.	3	7.10	3.30
Sun.	4	7.10	3.30
Mon.	5	7.10	3.30
Tue.	6	7.10	3.45
Wed.	7	7.10	3.45
Thu.	8	7.10	3.45
Fri.	9	7.10	3.45
Sat.	10	7.10	3.45
Sun.	11	7.10	3.45
Mon.	12	7.10	3.45
Tue.	13	6.55	4.00
Wed.	14	6.55	4.00
Thu.	15	6.55	4.00
Fri.	16	6.55	4.00
Sat.	17	6.55	4.00
Sun.	18	6.55	4.00
Mon.	19	6.55	4.00
Tue.	20	6.45	4.10
Wed.	21	6.45	4.10
Thu.	22	6.45	4.10
Fri.	23	6.45	4.10
Sat.	24	6.45	4.10
Sun.	25	6.45	4.10
Mon.	26	6.45	4.10
Tue.	27	6.30	4.20
Wed.	28	6.30	4.20
Thu.	29	6.30	4.20
Fri.	30	6.30	4.20
Sat.	31	6.30	4.20

TOTAL HOURS DURING 1907.

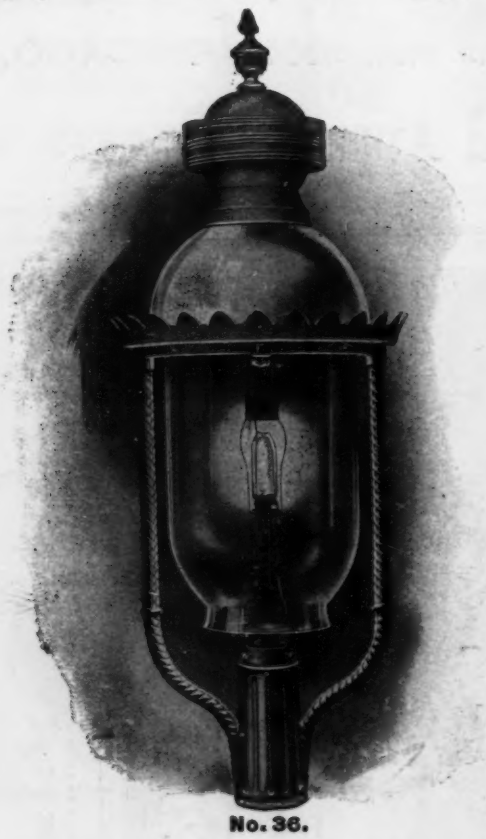
By Table No. 2.

	Hrs.Min.
January	423.20
February	355.25
March	355.35
April	298.50
May	264.50
June	234.25
July	243.45
August	280.25
September	321.15
October	374.30
November	401.40
December	433.45
Total, yr.	3987.45

NEW YORK, 318 West 42d Street.
BOSTON, 820 Beacon Building.
PHILADELPHIA, Broad and Arch Streets.
ST. LOUIS, 712 Roe Building.
CHICAGO, 218 La Salle Street.
SAN FRANCISCO, 512 Oak Street.

WELSBACH STREET LIGHTING COMPANY

....OF AMERICA....



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Will Not Flash Back.
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Extra Strong and Durable.
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Bridgeport, Conn. (3d contract).
Suffolk, Va.
Winsted, Conn. (2d contract).
Nashua, N. H.
Augusta, Me. (2d contract).
Everett, Mass.
Jenkintown, Pa. (2d contract).
Coney Island, N. Y.
Mexico, Mo.
Jacksonville, Fla.
Syracuse, N. Y. (2d contract).
Atlanta, Ga. (3d contract).
Holyoke, Mass.
Peoria, Ills.
Schnectady, N. Y. (2d contract).
Danbury, Conn.
Galveston, Tex. (2d contract).
Quebec, Canada.
Indianapolis, Ind. (2d contract).
Bessemer, Ala.
Waterbury, Conn. (5th contract).
Sioux Falls, S. D. (3d contract).
Philadelphia, Pa.

TOTAL SETS INSTALLED TO JULY 1, 1907, ... 34
TOTAL SETS TO DATE, ... 668
TOTAL DAILY CAPACITY, ... 541,655,000 cu. ft.

Tar Extractors for Carburetted Water Gas.
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Straight Standpipe System for Coal Gas Retorts.
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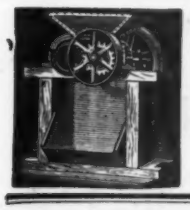

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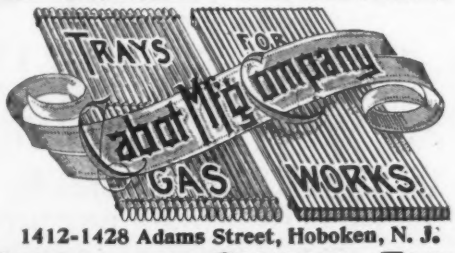

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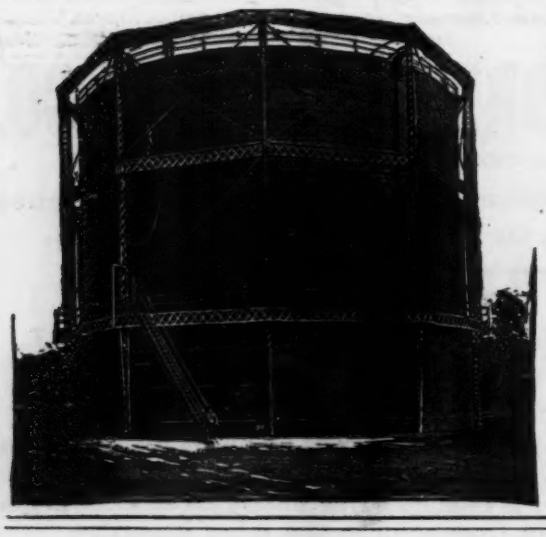

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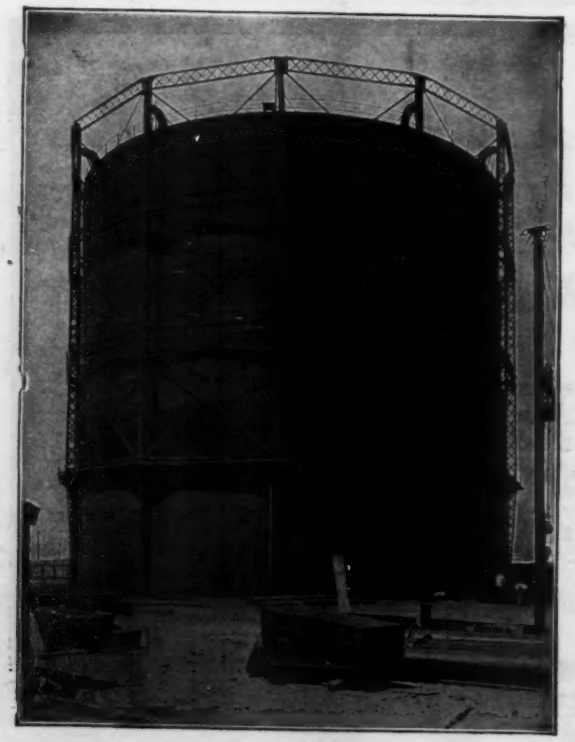

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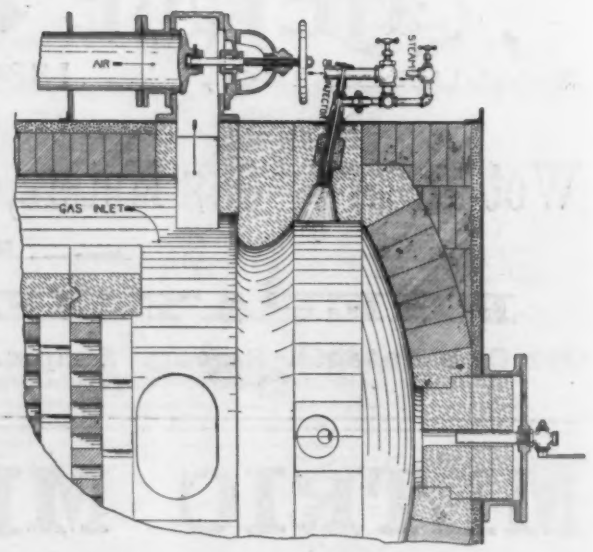

The oil is sprayed into this roomy chamber, where the mist or spray is quickly gasified by the radiant heat thrown into it from all sides. The blue gas passes up the "uptake flue" at the left, after leaving its ashes and cinders behind. It meets the *vaporized* oil at this point and the two are thoroughly mixed.

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